S. HRG. 99-899

THE ECONOMIC IMPACT OF THE OIL PRICE COLLAPSE

HEARING

BEFORE THE

SUBCOMMITTEE ON TRADE, PRODUCTIVITY, AND ECONOMIC GROWTH

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

NINETY-NINTH CONGRESS

SECOND SESSION

MARCH 12, 1986

Printed for the use of the Joint Economic Committee

U.S. GOVERNMENT PRINTING OFFICE
62-445 O
WASHINGTON : 1986

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

J841-34

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CONTENTS

WITNESSES AND STATEMENTS

WEDNESDAY, MARCH 12, 1986

Page

Lungren, Hon. Daniel E., vice chairman of the Subcommittee on Trade, Productivity, and Economic Growth: Opening statement 1
Scheuer, Hon. James H., member of the Subcommittee on Trade, Productivity, and Economic Growth: Opening statement 2
Verleger, Philip K., Jr., Verleger Associates, consultant to Charles River Associates 3
Kalt, Joseph P., associate professor of economics, Harvard University 22
Friedman, Edward, Shearson Lehman Bros 42
Prakken, Joel L., Laurence Meyer & Associates 53

SUBMISSIONS FOR THE RECORD

WEDNESDAY, MARCH 12, 1986

Friedman, Edward: Prepared statement 44
Kalt, Joseph P.: Prepared statement 26
Prakken, Joel L.: Prepared statement 56
Verleger, Philip K., Jr.: Prepared statement 7

APPENDIX

Texaco, Inc.: Statement of 89

THE ECONOMIC IMPACT OF THE OIL PRICE COLLAPSE

WEDNESDAY, MARCH 12, 1986

CONGRESS OF THE UNITED STATES,
SUBCOMMITTEE ON TRADE, PRODUCTIVITY,
AND ECONOMIC GROWTH
OF THE JOINT ECONOMIC COMMITTEE,
Washington, DC.

The subcommittee met, pursuant to notice, at 10:05 a.m., in room 2359, Rayburn House Office Building, Hon. Daniel E. Lungren (vice chairman of the subcommittee) presiding.

Present: Representatives Lungren and Scheuer.

Also present: Chris Frenze, professional staff member.

OPENING STATEMENT OF REPRESENTATIVE LUNGREN, VICE CHAIRMAN

Representative LUNGREN. Welcome to this hearing today before the Subcommittee on Trade, Productivity, and Economic Growth of the Joint Economic Committee.

I am sorry I was a couple minutes late. We had a matter before the Judiciary Committee that I had to take care of before I came over here.

It gives me great pleasure to welcome the distinguished witnesses before us today.

The recent oil price collapse may prove to be one of the most significant economic events of the 1980's. Over the last 3½ months the spot price of oil has dropped over 50 percent. It is currently selling for somewhat over one-third of its price of a year ago. The drop in oil prices could be a tremendous boon to the economy as well as to the individual consumer.

The unraveling of OPEC obviously means that a larger quantity of oil is now available at any price. This permits a higher level of total output as oil displaces less efficient forms of energy in use, freeing them for use elsewhere. The greater quantity of energy available at a given price may be compared to an increase in the resource endowment of our society. We simply have more to work with at the present time, under present conditions.

This may tend to boost economic growth, productivity, and American living standards. At the same time, inflationary pressures would be restrained. Furthermore, budget deficits could possibly be lower than they would otherwise be. So long as hard times in producing areas are not permitted to lead to serious financial problems, the economic impact of the oil price collapse would seem to be very, very positive. I know that is hard for certain people in Texas and California and some of the other oil-producing States to believe right now, but I hope that we will get some comments from our panel on that.

However, some in Congress are now advocating measures that would seem to rob the economy and consumers of gains from lower oil prices. I would hope that before Congress moves to enact any such potentially counterproductive measures it would carefully consider all the facts.

The purpose of the hearing this morning is to establish what is happening in the oil markets and why, and perhaps how long these things will be happening in the oil market. Only after Congress is fully informed should it consider what policy response, if any, is appropriate.

I might just mention that we have a distinguished panel today, made up of Mr. Philip Verleger of Charles River Associates; Mr. Joseph Kalt, the Department of Economics of Harvard University; Mr. Edward Friedman of Shearson Lehman Bros.; and Mr. Joel Prakken of Laurence Meyer & Associates.

Gentlemen, before you begin, I would just ask my colleague, Congressman Scheuer, if he has any statement to make.

OPENING STATEMENT OF REPRESENTATIVE SCHEUER

Representative SCHEUER. I think we all came to hear the witnesses. We have seen an event of monumental proportions take place that will have ripple effects throughout the global economy as well as throughout our own. We have seen in the last 12 or 13 years a transfer of resources from the non-oil-producing States to the oil-producing States in the trillions of dollars, the largest transfer of resources in the history of human civilization. Apparently that is going to come to a grinding halt, or at least be vastly reduced in its dimensions. This has to have a tremendous stimulative effect on our economy, on our employment, and on our ability to compete in global trade.

I think we have to give special consideration to some of the poor Third World oil-producing economies that promise to be shattered by this trend, if it continues. By and large, although my heart goes out to our colleagues from Oklahoma, Texas, and California, our country is by far the better off and the global economy is by far the better off. We ought to be opening a bottle of champagne here this morning before the hearing.

We are both looking forward to the testimony of the four witnesses, and I thank my colleague, the vice chairman.

Representative LUNGREN. Thank you very much.

I would ask that we have all the statements made by the four panelists and then we will open up to questions and answers, and, hopefully, if we direct a question at one of you and any of the others would like to respond, you might do that as well.

We have your prepared statements and they will be made a part of the record, without objection. Therefore, if you wish to read from them or summarize them or discuss them in any manner, it would be appropriate.

We would ask that you limit your opening remarks to 10 minutes apiece so that then we could get into questions and answers.

I will just go from my left to right. First of all, Mr. Philip Verleger of Verleger Associates of Washington, DC, and a consultant to the Charles River Associates.

STATEMENT OF PHILIP K. VERLEGER, JR., VERLEGER ASSOCIATES, CONSULTANT TO CHARLES RIVER ASSOCIATES

Mr. VERLEGER. I am pleased to be here today. Let me note that I share your belief that the news on oil prices is the best news for consumers in the free world for the past 15 years. Saudi Arabia and the oil producers have given the consumers of the world a tax cut amounting to about $400 billion.

The question I believe that Congress should address is why this is happening, especially before Congress makes any attempt to decide whether or not action on an oil import fee is required or if some other form of action is required.

What I would like to focus on today is really why prices have declined and what the implications are, particularly for Mexico. I believe it is an action by Saudi Arabia that is motivated by economics. I think that the Saudi Arabians had three reasons for their actions in bringing down the prices of the world oil market.

First, Saudi Arabia needed to act to maintain a meaningful share of the world oil market both in the short term and the long term.

Second, Saudi Arabia's income from the sale of oil had declined to a precariously low level and had begun to be impinged upon by the rapid decline of the dollar after March 1985. It had gotten to a point where Saudi Arabia really had nothing to lose.

The primary cause of their action was undoubtedly the desire to recapture a significant share of the world oil market. In 6 years they had seen their share of free world production decline from 19 percent to 6 percent. Further, they had observed several troubling trends:

The decline in the role of the swing producer.

The encroachment of a number of small producers who continually nipped at their heels like small dogs.

The failure of oil consumption to keep pace with economic growth.

I think their troubles began as they observed that the role for the swing producer had declined substantially. You may recall that in 1982, again in 1983, and then in 1984 Saudi Arabia prevailed upon the members of OPEC to reduce production, to reduce the quota, and agreed to serve as the swing producer.

They had seen their quota cut from 7 million barrels a day to 4.3 million barrels a day. It was a quota which they accepted on average over a whole year, or until the next quota was set, where they would cut production when demand declined and they would increase production during cold winter months.

What they discovered as time passed was that the swing in production was gradually shrinking. As I laid out on table 1 of my prepared statement, it had declined from 6 million barrels a day in 1979 to only 1.8 million barrels a day by 1985.

The decline was particularly troubling since all the other members of OPEC essentially increased production a little every time winter came along. This last September the Saudi Arabians introduced net-back pricing in an attempt to preempt, just as one preempts in bridge, the seasonal swing in demand. Prices would not have gone down if the rest of the members of OPEC had allowed them to preempt it. But they didn't.

The third troubling factor facing Saudi Arabia was the increase in supplies from other producers. We have seen the increase from Mexico; we have seen the increase from Norway; but what the public has not noted is that the world has effectively created four other Norways and is in the process of creating a fifth.

These are countries that consume most of the oil they produce. They are India, Brazil, Malaysia, and Egypt. Together those four countries account for a substantial portion of the increase in the "other" category that the petroleum economists follow.

The production increases in these countries has been truly phenomenal, ranging from 217 percent between 1979 and 1985 in Brazil and only a modest 148 percent in India. Production in Egypt and Malaysia had each increased by substantial amounts and in Malaysia the increase could have been larger had that nation not elected to hold production down.

The other troubling fact is that Colombia was sitting on the horizon probably going to export 50,000 barrels a day this year and prospectively increase exports to as much as 200,000 barrels a day by 1990.

Another troubling factor facing the Saudi Arabians was that consumption had not been increasing. As I show on figures 1 and 2 of my prepared statement, the consumption throughout the world of light products—gasoline, distillate fuel oil, and other products—had remained remarkably steady between 1974 and 1985.

The big encroachment had come in the heavy fuel oil category, which I show at the top of figure 1, where consumption had declined, I believe, from about 14 million barrels a day to 8 million barrels a day, with most of the decline occurring in the OECD countries.

As a matter of fact, if one examines figure 2, one sees that in the rest of the non-Communist world residual fuel oil consumption had increased between 1974 and 1985.

This last summer I believe that the Saudi Arabians were extremely troubled because they noted that there had been little increase in consumption in 1984–85 and less was projected in 1986 despite strong economic growth. Growth in the OECD had been as much as 4.8 percent in 1984, 3 percent in 1985, and was projected to be 2.5 percent in 1986. They could see encroaching supply, declining consumption, and they effectively decided that something needed to be done.

Why did they wait and act last summer? I think because they had been cushioned from the decline in lower oil revenues by the strength of the dollar. Nominal revenues of Saudi Arabia had declined from approximately $100 billion in 1981 to $30 billion in 1985. That is a large swing even by the scale of the U.S. budget. On a real basis, if adjusted for the trade-weighted value of the dollar, the decrease had been from something like $90 billion to $40 billion.

All that changed last March. Between March 1985 and 1986 we have seen something like a 30-percent decline in the trade-weighted value of the dollar, and they decided action was required. The action was a brilliant ploy, the net-back sale, which effectively preempted sales by Mexico, preempted sales by North Sea producers, and has created a situation where they have taken a $10 reduction in price while the North Sea producers and the Mexicans have taken more like a $18 reduction in price.

In terms of the new environment, the principal losers will probably be Mexico, Nigeria, Indonesia, Malaysia, and maybe even Venezuela. The Mexicans are losing because of the substantial decline in price and also because of a reduction in volume.

I believe Mexico will have trouble selling 1.5 million barrels a day in 1986, their target for exports. I think they will be closer to 1 million barrels a day and that their revenues will not be the $15 billion that are projected by many of the economists, including those at the Institute for International Economics, but more like $8 billion, which means that Mexico will not need $6 billion, as has been projected recently, but more like $12 to $14 billion. This suggests that the problem is not Nicaragua for the U.S. Congress, but Mexico.

The key problem is, as I said, that the Mexicans have not figured out how to sell oil. They have been put in a very difficult situation by Saudi Arabia, and the Saudi Arabians do not seem to want to let them up.

Let me summarize by giving you my forecast of the price of oil.

I believe that the Saudi Arabians have pushed the price down in order to push out some other countries' exports and also to push down high-cost production from the United States. The question really is, will non-OPEC producers agree to cooperate at the coming meeting in Geneva? My expectation is that they will not. They will not come to their senses quickly enough and the result will be low and volatile oil prices, possibly single-digit prices over the next 12 and maybe even as long as 36 months.

I have two reasons for expecting low prices to persist for some time.

First, it is clear that the reestablishment of a benchmark price in the high teens or low twenties will not stop oil proliferation; it will not stop the Malaysias and the other countries from increasing supply, and it will not stimulate demand. Instead, it just postpones and prolongs the problem to another day.

My impression is that the leaders in Saudi Arabia recognize that a compromise today is probably not in the interest of either the kingdom or other oil exporting countries. I expect that they will demand a very high price to stabilize the market this weekend, a price which other countries will find politically unacceptable.

Second, it is also clear that most of the producers do not understand the problem yet. This failure to recognize the situation is best illustrated by a statement from Business Week of a Mexican official, who said, "Any cut in production has to come from OPEC countries and it has to be big."

Saudi Arabia's competitors—other oil-producing countries, independent producers, major oil companies, and natural gas companies—are all in a situation similar to that of the alcoholic for whom no cure is possible unless they recognize that their illness is their own problem.

Thank you very much for inviting me to appear.

Representative LUNGREN. Thank you very much for your testimony. Let me congratulate you on doing so well under the time limit.

[The prepared statement of Mr. Verleger follows:]

PREPARED STATEMENT OF PHILIP K. VERLEGER, JR.

Mr. Chairman, Members of the Committee, I am pleased to appear here today to discuss the changing conditions in the world oil market. In my testimony I will try to describe to you the reasons I see for the decline in prices which has occurred over the last six months. I will also contrast the impacts the decline in prices will have on some producing nations. Finally I will offer some thoughts on the movement in oil prices.

Let me begin by noting that it is my belief that the decline in oil prices is probably the best news for the free world economy in the last fifteen to twenty years. The world oil producers, and especially Saudi Arabia, are offering consumers in developed and underdeveloped countries the equivalent of a tax cut worth $ 400 to $ 500 billion per year. Fallout from this tax cut measured in terms of increased rates of economic growth, lower inflation, and higher employment could be truly extraordinary.

The question I believe this committee ought to address is, why should the price cut come at this time and not earlier as had been predicted by many economists including myself. Further, the committee needs to address the question as to the permanence of the price cut.

It is my belief that the decline of prices has been brought about by Saudi Arabia's decision that action was needed to regain a meaningful share of the market. Further, leaders of Saudi Arabia concluded a meaningful market share could only be recaptured if the price of oil were allowed to decline to the point where consumption was stimulated and where production of high cost alternatives and high cost oil became uneconomic. This type of transformation will require some time to take full effect. Thus the implication of my analysis is that Saudi Arabia and possibly a few other members of OPEC have decided to bring down the price of oil to a level below $20 a barrel and perhaps below $10 a barrel and to hold it at that level for at least two to three years barring a very major change on the part of other producing countries and major oil companies. This policy will obviously have serious implications for poor oil producing countries such as Mexico, Nigeria and Venezuela. These countries may suffer particularly adverse consequences if they continue to maintain their historical practices of marketing oil through "special" arrangements rather than by trying to market oil as a commodity. It is my expectation that the developed oil exporting countries, Norway and the United Kingdom, will probably be able to weather this storm with little or no difficulty.

Three reasons can be offered to explain Saudi Arabia's recent actions on the world oil market. First, Saudi Arabia needed to act to maintain a meaningful share of the world oil market both in the short term and the long term. Second, the Saudi's income from the sale of oil had declined to a precariously low level and began to be impinged upon by the rapid decline of the dollar after March 1985. Finally, Saudi Arabia had nothing to lose even if an oil price war led to a financial collapse. In short, Saudi Arabia had allowed itself to be painted into a corner from which there was no escape save by creating a price war. Further, it appears that Saudi Arabia would be better off even if the price war led to a financial collapse and a serious recession.

Pursuit of a Meaningful Market Share

The primary cause of Saudi Arabia's action was undoubtedly a desire to recapture a meaningful share of the world oil market. In six years the Saudis had seen their share of free world production decline from 19% to 6%. Further they had observed several troubling trends. These were

- The decline in the role of a swing producer,
- The encroachment of a number of small producers,
- The failure of oil consumption to keep pace with economic growth.

The diminished role of the swing producers represents a major explanation for Saudi actions. It may be recalled that Saudi Arabia first accepted the mantle of the swing producer after the March 1982 OPEC meetings. This role was reaffirmed at the March 1983 and October 1984 meetings. Through this period Saudi Arabia agreed to accept an average quota which ranged from 7 million barrels a day in 1982 to 4.3 million barrels a day in 1984. Saudi Arabia also agreed to lower production during periods of slack demand while increasing production during winter months when demand peaked.

Unfortunately the winter swing in demand was shrinking at the same time. The change in patterns of oil use may be observed from Table 1 where levels of consumption in IEA countries during the quarters of low demand (second and third quarters) are compared to levels of demand during periods of peak consumption. According to the data shown in Table I the seasonal swing is a decline from approximately 6 million barrels a day in 1979 to less than 2 million barrels a day in 1985. The diminished role for the swing producer must eventually have caused the Saudis to wonder about the advisability of their strategy.

The steady increase in supply from other smaller producers also created an obvious problem for Saudi Arabia. Between 1979 and 1985 free world consumption declined by 7 million barrels a day while OPEC production declined by 14 millions barrels a day. During the same period, OPEC production net of Saudi Arabia had declined by 8 million barrels a day while Saudi Arabia's production had declined by 6 million barrels a day.

TABLE 1

Free World Seasonal Oil Consumption

(million barrels per day)

	Average of Second And Third Quarters	Average of Fourth And First Quarters	Difference
1974	31.0	33.9	2.9
1975	30.2	33.6	3.4
1976	31.2	33.5	2.3
1977	31.8	36.4	4.7
1978	32.2	36.7	4.5
1979	32.1	38.4	6.3
1980	30.2	36.2	5.9
1981	29.6	33.4	3.8
1982	28.9	31.7	2.8
1983	29.1	30.2	1.0
1984	29.8	31.6	1.7
1985	29.6	31.4*	1.8

*Fourth quarter only
source: IEA, Oil Market Report

The drop in OPEC production had been offset by increases in output from Mexico, the North Sea, and other areas. For example, Mexican production averaged only 1.4 million barrels a day in 1979, while through the first eleven months of 1985 it averaged 3 million barrels a day. During the same period the North Sea and U.S. production increased by 1.6 and 0.4 million barrels a day respectively. A further increase in production came from the countries commonly lumped in the "other" category. Output in these countries increased from 5.4 million barrels a day to 7 million barrels a day. Approximately three quarters of the increased production from other countries came from Brazil, Egypt, India and Malaysia, countries not ordinarily considered major oil producers. Production in Brazil increased by 217% from 170 mbd to 540 mbd. Production in India increased by a startling 148% from 250 mbd to 620 mbd. Production in Egypt and Malaysia "only" increased by 69% and 50% from 520 mbd to 880 mbd in the case of Egypt and from 260 mbd to 400 mbd in the case of Malaysia. Further production increases could be expected from each of these countries since each operated outside the OPEC club and each had very obvious needs for income from the exportation of oil or to reduce the cost of oil imports. In addition, new entrance to the non-OPEC club could be anticipated in 1986 and 1987. For example, Columbia had announced plans to begin exporting approximately 50,000 barrels a day in early 1986.

The trend in production by the non Arab members of OPEC was also troubling. None of these countries had been willing to take permanent cuts in production since 1981 and political turmoil had become so great in one, Nigeria, that further adherence to any quota level was in doubt. Economic austerity programs in Nigeria, Indonesia, and Venezuela probably signaled the need to increase output in those countries.

Finally, the stamina of the Arab block of producers was beginning to flag. In the summer of 1985 Iraq indicated it would need an increase in its production quota and Iran had not disguised its efforts to increase sales. Thus, the trends suggested that Saudi Arabia faced a very real (and preposterous) threat of being squeezed out of the world oil market. Indeed, the trends of production in other OPEC countries and in non OPEC countries appear to indicate that by 1987 the swing producer would have to import oil, an obviously absurd proposition.

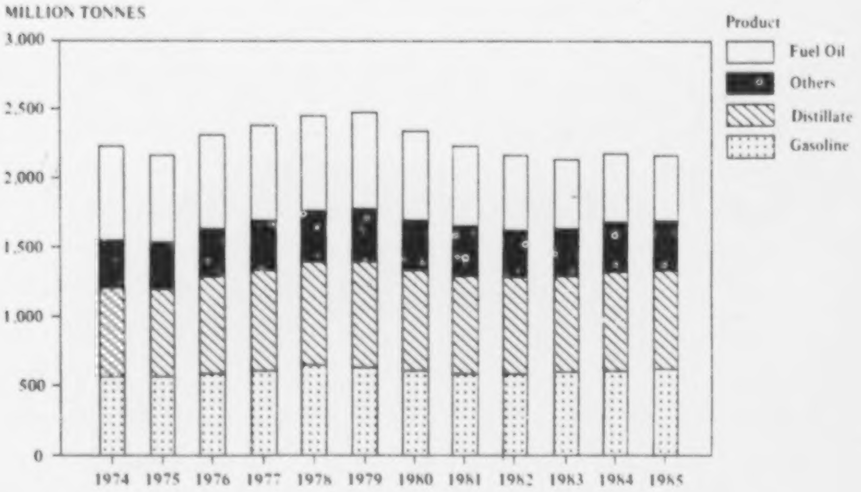
By engineering a substantial reduction in the price of oil Saudi Arabia obviously intended to slow or arrest this encroachment by many smaller or high cost producers. Developments in high cost areas such as Columbia and the United States must be funded from private capital. Suppliers of that capital, major and independent oil companies, should be expected to reduce their expenditures if expectations for long run prices of oil were changed. Thus, the Saudis probably intended to bring prices down for a long enough period of time to slow or stop this proliferation of oil supply.

Saudi Arabia probably also intends to increase oil sales over the next five years by stimulating increased consumption. This increase would come from two sources: economic growth and substitution. It is unlikely that a reduction in the conservation "ethic" was anticipated.

The first source of increased use would come from displacement of coal and natural gas from boilers through out the world. The trends in consumption over the last eleven years, depicted in Figure 1, indicate that consumption of light products (gasoline, heating oil and jet fuel) had remained relatively steady while consumption of heavy fuel oil (residual fuel oil) had declined by 33 percent. The sharp drop after 1979 was particularly noticable. Planners in many oil exporting countries recognized that most of the drop in the use of heavy fuel oil could be traced to substitution efforts in the United States, Japan and Western Europe. In the United States coal and natural gas had captured large portions of the petroleum market while in Japan and Europe new nuclear power plants started after 1979 were beginning to permanently displace oil. Lower oil prices were required to stop or reverse this substitution.

Figure 1

DISTRIBUTION OF CONSUMPTION OF PETROLEUM PRODUCTS FOR FREE WORLD

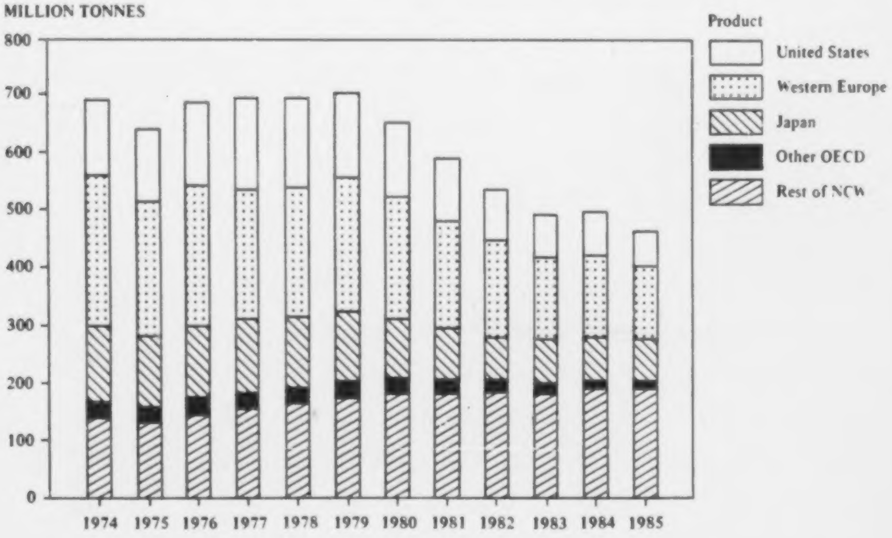


SOURCE: BP Statistical Yearbook.

Lower oil prices would also stimulate the use of heavy fuel oil in developing countries. The use of heavy fuel oil in developing countries had increased at modest rates since 1974 despite relatively slow rates of economic growth. (See Figure 2.) One aim of the price cut was to stimulate use in developing countries.

Figure 2

DISTRIBUTION OF CONSUMPTION OF RESIDUAL FUEL FOR FREE WORLD



SOURCE: BP Statistical Yearbook.

The decision to engineer lower oil prices also probably resulted from a desire to stimulate faster worldwide economic growth. While the elasticity of consumption with respect to GDP growth has declined since 1979, it is still approximately 0.5. Thus oil exporters could expect to benefit from greater sales resulting from the more rapid economic growth caused by lower oil prices. The decline in prices could add as much as two percentage points to worldwide growth rates and add perhaps a million barrels a day to demand by 1987.

However, the primary macro economic explanation for the price cut may have been defensive, not offensive. Diminishing prospects for worldwide economic growth must have troubled Saudi Arabia. The U.S. recovery from the 1981/82 recession was in its third year in 1985 and was beginning to peter out. At the same time it became clear that the high rates of growth recorded in the Pacific rim had become history. Growth in the OECD was projected to decline in 1986 to 2.7 percent, down from the 4.9 percent rate recorded in 1984 and 3.2 percent rate recorded in 1985. Oil consumption would have continued to decline in 1986 and 1987 in the absence of some type of economic stimulus.

In summary, the prospects of lower consumption, increased supplies from smaller nations and the diminished role of the swing producer created a situation which forced a change of policy on oil exporting countries. Saudi Arabia took unilateral action because it was not able to make other producers understand the dimensions of the problem.

Declines in Oil Export Revenues

The timing of the collapse in oil prices is probably related to the decline in the value of the dollar. Until 1985, oil exporting countries were cushioned from the impacts of declining export revenues by the increase in the value of the dollar. For example, between 1981 and 1985 the nominal value of Saudi revenues had declined by 76 percent. However, the loss in income was cut by a third due to the increased value of the dollar. This benefit came to a sudden end in March 1985. Since March the value of the dollar has declined by more than 20 percent, causing the sharpest drop in real export earnings of oil producing countries since 1973. It should not seem surprising that Saudi Arabia changed its strategy when its real income began to drop precipitously.

It should also be noted that Saudi Arabia does not appear to have anything to lose from the decline in oil prices. A continuation of the trends in the market established between 1981 and 1985 would have eventually pushed the Saudis out of the market. By last summer the price environment, allocation of production among OPEC countries, and levels of cheating had all reached a point at which Saudi Arabia's income from the sale of oil for the next few years was probably at a minimum level. Thus, the kingdom had nothing to lose from a price war even if the war led to a world wide depression. Volumes of sales and revenues would be greater even in the case of a financial collapse than they would be if no change in policy had been made.

The losers from the New Environment

The principal losers from lower oil prices will be Mexico, Nigeria, other populated exporting countries such as Indonesia and Malaysia, independent oilmen and suppliers. In the United States the casualties are already beginning to mount. Smith International, a company which reported net income of $133 million in 1981, entered chapter 11. Unemployment in Texas increased by 130,000 in February. Many oil companies are announcing sharp reductions in capital expenditures and reductions in employment.

Among exporting nations both Nigeria and Mexico face great difficulties. Nigeria has announced that it will be unable to service its modest foreign debt and has asked its bankers to reschedule payments. Mexico has indicated that it will require at least $ 6 billion in new loans in 1986. Unfortunately, this estimate is probably off by a factor of two. Mexico may need as much as 12 billion dollars in 1986.

Mexico is suffering in three ways from the decline in oil prices. First, the decline in prices is obviously cutting export revenues. Second, Mexico is being forced to accept a much larger cut in prices than other countries, such as Saudi Arabia. Finally, buyers are turning away from Mexico's oil because Mexico will not price it competitively.

The problem faced by Mexico is caused by Saudi Arabia's use of netback contracts. Twelve months ago Mexican crude sold at perhaps a $ 2.00 per barrel premium to Saudi crude after adjustment for quality differences. This premium could be traced to the differences in shipping distances for Saudi and Mexican crudes. Nervous buyers, concerned about the prospects for a decline in prices turned to "close haul" crudes from Mexico, the North Sea and Venezuela. Long haul crudes had to be sold at a discount to remain competitive. Saudi Arabia was a major loser in this situation.

Saudi Arabia remedied this problem by introducing netback contracts. These contracts establish the price of crude oil from the prices of products at the time the oil is received or even after the oil is received effectively making the Saudi crude the closest of close haul crudes. Saudi Arabia's adoption of netback contracts instantly eliminated the premium enjoyed by Mexico's oil. However, the situation has been made worse by the fact that Mexico has refused to adopt netback contracts. Until the end of January PEMEX insisted on selling oil following established practices where prices were set at the end of the month, after crude cargoes were lifted. The effect of this practice was to make Mexican crude the long haul crude. Mexican crude oil must sell at a discount of $ 2.00 to $ 4.00 to Saudi oil if it can be sold at all. Over the last few weeks it has become increasingly apparent that the oil cannot be sold at all. Mexican exports have declined by as much as one third, and could fall further. The economic, social and political consequences of Mexico's inability to sell oil could be extremely troubling for both Mexico and the United States.

Conclusion: Whither the Price of Oil?

I have tried to describe the reasons for the sharp drop in the price of oil. As I noted above, the basic explanation may be found in the fact that Saudi Arabia was being squeezed from the market. This was not a situation which could last because Saudi Arabia was the world's largest potential producer of oil and was also clearly the world's lowest cost producer. Its response has created serious troubles for many oil exporting countries as well as U.S. producers of oil and other fuels. The question is, will those other producers most affected by Saudi Arabia's actions respond by cooperating to cut production and stabilize prices in the high teens or low twenties or will they continue to compete with Saudi Arabia in a fruitless, useless battle to maintain market share?

My expectation is that other exporting countries will not come to their senses, will not cut production and will try to fight it out with Saudi Arabia. The result will be low but volatile oil prices. Single digit prices are a clear possibility for the next twelve to thirty-six months.

I have two reasons for expecting low prices to persist for some time. First, it is clear that the reestablishment of a benchmark price in the high teens or low twenties will not stop oil proliferation and will not stimulate demand. Instead, it just prolongs and postpones the problem to another day. My impression is that the leaders in Saudi Arabia recognize that compromise today is probably not in the interest of either the Kingdom or other oil exporting countries. I expect that Saudi Arabia will demand a very high price to stabilize the market, a price which other countries will find to be politically unacceptable.

Second, it is also very clear that most of the producers do not understand the problem. This failure to recognize the situation is best illustrated by the following statement by a Mexican official published in Business Week, "Any cut in production has to come from OPEC countries and it has to be big." Saudi Arabia's competitors - other oil producing countries, independent producers, major oil companies, natural gas producers, coal companies, and drilling contractors - are all in a situation similar to the alcoholic for whom no cure is possible until he recognizes that his illness is his problem and that he must cooperate to cure it.

Representative LUNGREN. Next is Joseph Kalt, associate professor of economics at Harvard University.

Welcome. You may proceed.

STATEMENT OF JOSEPH P. KALT, ASSOCIATE PROFESSOR OF ECONOMICS, HARVARD UNIVERSITY

Mr. KALT. I appreciate the opportunity to contribute to this hearing. I would like to make any remarks primarily directed at the question of domestic economic impacts of the recent decline in world oil prices.

We are all aware that oil prices in the international marketplace have fallen by more than $10 per barrel over the last 2 months. What seems to be less well understood is the depth of the decline in oil prices since their peak in 1980 and the relationship between today's prices and the preembargo days of the early 1970's.

In figure 1 of my prepared statement you will find a description of the path of real, that is, inflation-adjusted oil prices, over 1972 through today. This adjustment for inflation is necessary if we are to be able to compare the true cost, that is, the real purchasing power, that buyers have been paying for oil over the years.

Real crude costs for the Nation peaked in 1980. Since then peak prices have been on a sharp and consistent decline. Indeed, the recent drop in oil prices represents an acceleration of a trend toward lower real oil costs rather than a reversal of a trend toward higher prices.

Significantly, after adjusting for inflation, crude oil prices in the world marketplace now stand close to the prices that prevailed in 1972 and 1973. Before the OPEC embargo of October 1973 a barrel of crude oil cost the Nation approximately $3.50. In 1972 dollars the present price of $14 per barrel translates into roughly $5 per barrel. In fact, with a decline in current prices of just a few more dollars, such as Phil Verleger just suggested might occur, we will have come full circle on the energy crisis.

Oil price changes of the magnitude we are going through have profound effects on oil producers and oil consumers. Moreover, because other forms of energy, such as natural gas and coal, compete at the margin with petroleum products, the prices of these other fuels are ultimately driven by the world price of oil. As a result, producers and consumers throughout the general energy marketplace have significant stakes in the path taken by oil prices.

The natural question to ask, of course, is whether the recent decline in oil prices is an unambiguous net benefit for the Nation, or whether there are current or future pitfalls against which we should be protecting ourselves?

In the face of falling prices, domestic energy producers, for example, argue that operations will have to be curtailed and the Nation will shrink its energy production capacity. Energy consumers, on the other hand, are presented with strong incentives to increase their use of energy after years of attempting to conserve.

Where does the net economic interest of the United States lie?

The United States is a net importer of energy; we are a net consumer of the rest of the world's energy resources. Consequently, the aggregate interests of the Nation lie in lower rather than higher world oil prices. Other things equal, a fall in international oil prices raises the national wealth. This improvement, however, is accomplished at the expense of oil and other energy producers.

Falling oil prices benefit oil users by making current levels of oil use less expensive and by making it possible to apply oil and other fuels to new uses that were uneconomical when oil prices were high but which yield value in excess of cost now that they are low. These new uses include new factories that otherwise would have been unprofitable, expanded output from the agricultural sector, which is notably energy intensive, expanded markets for firms and services that were previously limited by transportation costs, and so on throughout the energy using sectors of the economy.

The energy producing sector of the economy, on the other hand, is demonstrably harmed by falling oil prices. That sector can now be expected to cut back significantly its levels of operation.

Discussions of the impact of falling oil prices on the oil industry are often flawed by a view of the industry as monolithic, that is, the view of the industry as if it is uniformly harmed by falling oil prices. This characterization overlooks the crucial distinction between oil companies that are primarily crude oil producers and those oil companies that are primarily crude oil users. Crude oil users include refiners, petrochemical manufacturers and petroleum product retailers and wholesalers. These users of crude oil stand to benefit dramatically from lower oil prices.

The benefits of falling oil prices are then felt downstream by those who use the output—the gasoline, fuel oil, and so forth—of crude oil users. Expanded output by refiners, petrochemical companies and oil product distributors necessarily forces prices down relative to what businesses and final consumers of oil products would otherwise have faced.

This last conclusion may appear somewhat controversial in light of the current concerns over whether the recent price declines in world crude oil markets will show up at the pump. These concerns illustrate a misconception that costs determine prices. In a relatively short timeframe when demand for oil products is stable prices depend on supply, not on costs. Expanded crude oil output, especially the recent output from Saudi Arabia, requires time to be transported and transformed into additional petroleum products. Only when this additional product supply hits the market will consumer prices fall. Recent pressure is gathering force, and consumer prices have recently been falling quite rapidly.

In my prepared statement I have calculated the impacts of declining oil prices on crude producers and crude oil users. The latter category, crude oil users, includes everyone from oil refiners to gasoline consumers. Contained in the group denoted crude oil producers are producing company stock holders as well as royalty recipients, various State governments and others who receive income from crude oil production.

Relative to a world of $26 oil, domestic crude oil producers stand to lose net income at a rate of roughly $30 billion per year if crude oil prices stay in the neighborhood of $14 to $15 delivered. At the same time, the users of crude oil as a group in the Nation are realizing net gains at a rate of approximately $100 billion per year. The sharp difference between the gains of crude oil users and the losses of crude oil producers illustrates the net interest the Nation has in lower rather than higher oil prices.

The indicated losses of the domestic crude oil production industry are associated with depressed incentives for finding, developing and producing crude oil. My estimates indicate that if the world oil prices persist at current levels reserve additions by the domestic industry will be approximately 30 percent per year lower than they otherwise would have been. That is, lower than they would have been at $26 per barrel oil. Meanwhile, of course, crude oil using sectors of the economy will be expanding and domestic oil reserves not depleted today will be saved for future development.

Two of the clearest consequences of declining world oil prices are reduced investment in supply by the domestic energy producing sector and reduced incentives for energy conservation by the users of energy products. These responses raise a number of issues for energy policy.

First, does the Nation bear increased risks of international supply disruptions by failing to develop its domestic energy resources above the level that is dictated by market price incentives?

Second, is the Nation facing the possibility that consumers will myopically believe that energy prices will never again rise and that energy conservation is a thing of the past? In other words, could reduced energy efficiency set the stage for another energy crisis?

At first glance, the obvious solution to these problems might appear to be the imposition of an oil import tariff, were these problems real. A tariff would prop up both producer and consumer prices in the domestic economy and thereby spur both development of domestic energy resources and consumer energy conservation.

Of course, the fact that an oil import tariff would benefit oil and other domestic energy production and would deter energy consumption are not in themselves justification for a tariff. The commonly heard argument for a tariff, that is, that lower oil prices will now cause underinvestment in domestic energy production and wasteful overconsumption of energy products, are notably weak.

First, on the producer side it is not clear that tariff protection provides a defense for the Nation against oil supply disruptions or that a tariff provides more effective protection than the Strategic Petroleum Reserve or the agreements of the International Energy Agency. The 1973 oil supply shock occurred following almost 15 years of import protection for the domestic producers.

Moreover, evidence indicates that drilling activity in the domestic industry responds quite quickly to a given price change, with the vast majority of the response coming within 6 months. The rapidity of this response argues against maintaining a stockpile of protected domestic producers.

Finally, oil developed and produced today is not available tomorrow. We may want to save our oil for tomorrow.

On the demand side, it must be stressed that we would not want consumers to be excessively energy efficient. It is appropriate that consumers respond to lower energy prices by consuming more and reducing their efforts to conserve.

Energy conservation is not free. It results in the use of capital, labor, materials, engineers and scientists that might be allocated to other sectors of the economy. If energy in fact becomes less scarce and expensive, it is appropriate for the Nation to devote less of its resources to conservation in order to improve its output from other sectors of the economy.

The relevant question, of course, is whether the current decline in energy prices is likely to be perceived as more permanent than it really turns out to be? While it is possible that energy users will have expectations biased in this direction, that is, toward expecting low prices to persist indefinitely, the specter of myopic consumers foolishly returning to pre-1970's consumption patterns is not credible. Not only are the memories of 1973 and 1979 still fresh, but there is no obvious reason why consumers' expectations would be biased in the direction of low rather than high prices.

The Nation's energy using capital stock—machinery, buildings, automobiles, and so forth—is turned over relatively slowly in response to changes in energy prices. The improvements in energy efficiency put in place since 1973 will not quickly be abandoned in response to a fall in oil prices during the first 3 months of 1986.

Let me briefly say something about the sources of the decline in oil prices. It seems to me that if we are to understand where oil prices might go it is useful to look at the reasons why we are where we are today. I think there are four reasons we have seen the decline in real oil prices.

First, the sharp oil price increases in the 1970's brought forth extensive efforts to find additional energy supply both of oil and nonoil energy resources.

A second factor contributing to declining real oil prices in the 1980's has been the conservation efforts induced by the rising prices of the 1970's. Oil and other fuel demand is now substantially lower than it otherwise would have been. As I have said, the movement toward energy conservation is not likely to be quickly wiped out by lower prices.

A third factor contributing to the decline in oil prices was the elimination of U.S. price ceilings on oil and the continuing gradual decontrol of natural gas. In the case of oil, decontrol appears to have raised output by as much as 15 percent over what it otherwise would have been. Oil and gas price decontrol also increased the responsiveness of domestic energy supplies to world market conditions.

The preceding factors have contributed to the downward trend in oil prices that has operated since 1980. They do not, however, provide a full explanation for the very sharp drop in oil prices over the last 2 months. The key to this event, as Phil Verleger has described, appears to have been Saudi Arabia. By late 1985 Saudi Arabia found its revenue needs exceeding its revenue collection. Rather than borrow to finance its deficits, Saudi Arabia has apparently decided to raise revenues by selling more oil. The resulting impact on oil prices is why we are here today.

I will leave the future of oil prices to Mr. Verleger. Clearly, the keys in the short run lie with Saudi Arabia. Thank you.

Representative LUNGREN. Thank you very much.

[The prepared statement of Mr. Kalt follows:]

PREPARED STATEMENT OF JOSEPH P. KALT

The Economic Impact of Lower Oil Prices

My name is Joseph P. Kalt. I am an Associate Professor of Economics at Harvard University and Assistant Director for Natural Resources of the Energy and Environmental Policy Center at Harvard's Kennedy School of Government. I appreciate the opportunity to contribute to these hearings.

The recent precipitous drop in worldwide energy prices has once again surprised those of us who occasionally attempt to forecast oil prices. The drop in prices that we have experienced has been much larger and more rapid than anyone could credibly have predicted. While this experience presumably adds just one more nail in the coffin that holds the reputation of economists as forecasters, we may still be able to describe the economic implications of lower oil prices now that they are with us.

I. THE IMPORTANCE AND MAGNITUDE OF THE DECLINE IN WORLD PRICES

We are all aware that oil prices on the international marketplace have fallen by roughly ten dollars per barrel over the last two months. What seems to be less well understood is the depth of the decline in oil prices since their peak in 1980, and the relationship between today's prices and the pre-embargo days of the early 1970s.

Figure 1 shows the path of "real" -- inflation-adjusted to 1972 dollars -- oil prices over 1972 through 1986. This adjustment for inflation is necessary if we are to be able to compare the true cost, i.e., the real purchasing power, that buyers have been paying for oil over the years. The rapid inflation from the early 1970s through the early 1980s ate away at the value of each of the dollars given up to get a barrel of oil, and this has acted to restrain the cost of oil despite a general rise in the number of dollars charged per barrel.

Real crude oil costs for the nation peaked in 1980 (Figure 1). Since this peak, prices have been on a sharp and consistent decline. Indeed, the recent drop in oil prices represents the acceleration of a trend toward lower real oil costs, rather than a reversal of a trend toward higher prices.

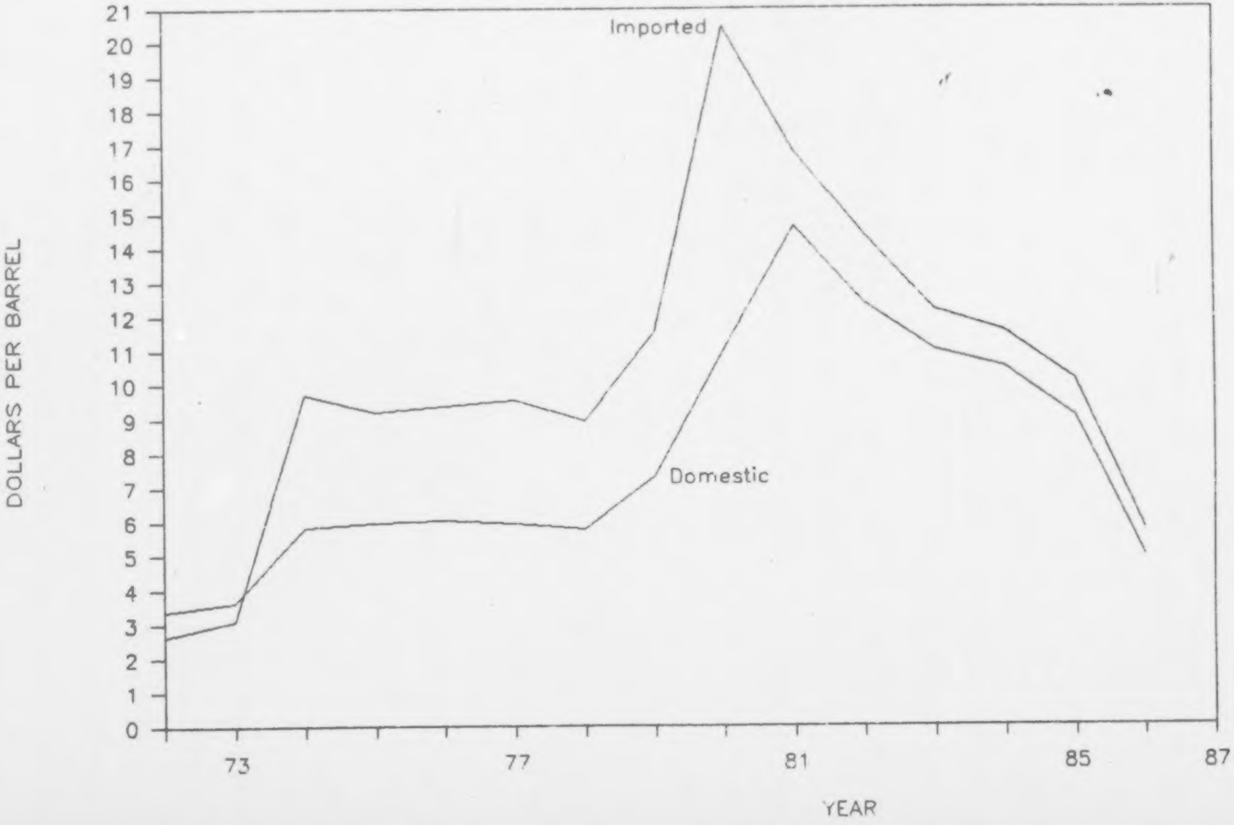
Significantly, after adjusting for inflation, crude oil prices in the world marketplace now stand close to the prices that prevailed in 1972-73. Before the OPEC embargo of October 1973, a barrel of crude oil cost the United States approximately $3.50. In 1972 dollars, the present price of $14-$15 per barrel translates into $5.30-$5.70 per barrel. These figures are, perhaps, how we should talk about oil prices since they allow us to compare today to years past. In fact, with a decline in current prices of just a few more dollars, we will have come full circle on the "Energy Crisis."

Oil price changes of the magnitude we are going through have profound effects on oil producers and oil consumers. Moreover, because other forms of energy, such as natural gas and coal, compete at the margin with petroleum products, the prices of these other fuels are ultimately driven by the world price of oil. As a result, producers and consumers throughout the general energy marketplace have significant stakes in the path taken by

Figure 1

CRUDE OIL PRICES: 1972 - 1986

INFLATION-ADJUSTED (1972 Dollars)



oil prices. In fact, because energy is such an important input to so many sectors of the economy, the sharp decline of oil prices is of significant consequence to the health of the overall national economy.

The natural question to ask, of course, is whether the recent decline in oil prices is an unambiguous benefit for the nation, or are there current or future pitfalls against which we should protect ourselves? In the face of falling prices, domestic energy producers, for example, argue that operations will have to be curtailed and the nation will shrink its energy production capacity. Energy consumers, on the other hand, are presented with strong incentives to increase their use of energy -- after years of attempting to conserve. The implications of these producer and consumer responses warrant consideration.

II. THE ECONOMIC IMPACT OF FALLING OIL PRICES

The United States is a net importer of energy: we are a net consumer of the rest of the world's energy resources. Consequently, the aggregate interests of the nation lie with lower, rather than higher, world oil prices. Other things equal, a fall in international oil prices raises the national wealth. This improvement is accomplished to the benefit of oil (and other fuel) users and at the expense of oil (and other fuel) producers.

Falling oil prices benefit oil users by making current levels of oil use less expensive, and by making it possible to apply oil (and other fuels) to new uses that were uneconomical when oil prices were high, but which yield value in excess of cost when prices are low. These new uses include new factories that otherwise would have been unprofitable, expanded output from the agricultural sector (which is notably energy-intensive), expanded markets for firms and services that were previously limited by transportation costs, and so on throughout the energy-using sectors of the economy.

The energy-producing sector of the economy, on the other hand, is demonstrably harmed by falling oil prices. That sector can now be expected to cut back significantly its levels of operation, as profits are squeezed out of high-cost exploration and development and the volumes that continue to be produced and sold generate less revenue.

Discussions of the impact of falling oil prices on the oil industry are frequently flawed by a view of the industry as monolithic, i.e., as if the industry is uniformly harmed by falling oil prices. This characterization overlooks the crucial distinction between those oil companies that are primarily crude oil producers and those oil companies that are primarily crude oil users. The latter include refiners, petrochemical manufacturers, and petroleum product wholesalers and retailers. These users of crude oil stand to benefit from lower oil prices. Lower oil prices make expanded operations more attractive, put excess capacity back to work, and create the returns upon which new capital investment can be undertaken.

These same influences of falling oil prices are felt downstream by those who use the output -- gasoline, fuel oil, petrochemicals, etc. -- of crude oil users. Expanded output by refiners, petrochemical companies, and product distributors necessarily forces prices down relative to what intermediate (i.e., business) and final consumers of oil products would have otherwise faced.

This last conclusion may appear somewhat controversial in light of current concerns over when the recent price declines in world crude oil markets will "show up at the pump." These concerns illustrate the misconception that costs determine prices. In a relatively short time frame when demand for oil products at any given price is relatively stable, prices depend not on costs, but on supply. Expanded crude oil output (especially from Saudi Arabia) in the last two months requires time to be transported and transformed into additional petroleum products. Only when this occurs should we expect final consumer prices to fall. Indeed, when expanded petroleum product output does hit the market, prices can not help but fall relative to what they otherwise would have been. Even if petroleum product markets were not competitive, this would be true: it is in the interests of a monopoly to increase sales when costs fall, and increased sales can only be realized by cutting prices relative to what they otherwise would have been.

Apart from "firms" with market power (fortunately not always exercised) in the world crude oil industry -- Saudi Arabia, the Soviet Union, Mexico, Norway, Great Britain -- oil markets appear to be characterized by a great deal of competition. This reflects: 1) the relatively free international flow of oil trade, 2) firms that are large in absolute size but small relative to the world marketplace, and 3) the ease with which entry into and exit from the marketplace occur. In this setting, the bulk of recent changes in crude oil costs can be expected to show up eventually in consumer prices. If not reversed, recent oil price declines are large enough to affect the level of capacity in the world's refining and petrochemical industry; putting additional capacity to work will expand output and restrain consumer prices. Of course, resulting declines in consumer prices may continue to be obscured by various taxes on petroleum products and moderate pressure from general inflation. At present, the downward pressure on petroleum product prices is clearly gathering force. Consumer prices have begun to fall rapidly over the last several weeks.

Table 1 reports calculations of the impacts of declining oil prices on crude oil producers and crude oil users, where the latter category includes everyone from oil refiners to gasoline consumers. Implicitly contained in the group denoted "crude oil producers" are producing company stock holders, as well as royalty recipients, various state governments, and others who receive income from crude oil production. The Table shows the aggregate income gains and losses of users and producers that are associated with price declines of varying sizes from an initial base of $26 per barrel. The losses of domestic crude oil producers are based on a statistical analysis of the responsiveness of supply efforts to prices, and the gains of users similarly depend upon the responsiveness of crude oil demand to prices. By knowing the supply responsiveness of producers, it is possible to calculate both the output level that will be attained at successively lower prices (and the associated loss in income on that output) and the output that will be suppressed by lower market prices. Mirror image calculations allow assessment of the impacts of lower prices on crude oil consumers.

Table 1 indicates that, relative to a world of $26 oil (as in 1985), domestic crude oil suppliers stand to lose net income at a rate of roughly $30 billion per year if crude oil prices stay in the neighborhood of $14-$15 per barrel for a full year (as current futures markets are betting will be the case). At the same time, the users of crude oil as a group are realizing net gains at a rate of approximately $100 billion per year, relative to a market of $26 crude oil. The sharp difference between the gains of crude oil users and crude oil producers illustrates the net interest the nation has in lower, rather than higher oil prices.

Table 1

THE IMPACT OF DECLINING WORLD OIL PRICES ON U.S. CRUDE OIL PRODUCERS AND CRUDE OIL BUYERS

(Billions of Dollars Annually)

WORLD OIL PRICE	LOSS OF CRUDE OIL PRODUCERS	GAIN OF CRUDE OIL BUYERS	NET IMPACT
$26.00	0	0	0
$25.00	-3	9	6
$24.00	-6	17	11
$23.00	-9	26	17
$22.00	-12	34	22
$21.00	-15	43	28
$20.00	-18	52	34
$19.00	-21	60	39
$18.00	-23	69	46
$17.00	-26	78	52
$16.00	-28	86	58
$15.00	-31	95	64
$14.00	-33	104	71
$13.00	-35	112	77
$12.00	-37	121	84
$11.00	-39	130	91
$10.00	-41	139	98

The indicated losses of the domestic crude oil production industry are associated with depressed incentives for finding, developing and producing crude oil. My estimates indicate that if world oil prices persist at current levels, reserve additions by the domestic industry will be approximately 30% per year lower than they otherwise would have been (i.e., had oil prices stayed at approximately $26). This, of course, implies lower levels of drilling rig operation and continued hardship for the crude oil producing industry. Meanwhile, of course, crude oil using sectors of the economy will be expanding and domestic oil reserves not depleted today will be saved for future development.

The net national gains from lower world oil prices (Table 1) tell only a partial story. Declining oil prices inevitably depress the prices of other energy sources, such as coal and natural gas. The nation can now expect to reduce its efforts to expand the supply of these energy sources -- to the detriment of producers. In the coal sector, which has a small level of net exports, the losses of producers from lower prices are likely to somewhat outweigh the gains of coal consumers.

As noted, the economy as a whole is a net energy (all types combined) importer, so that the gains of energy consumers as group from lower prices outweigh the losses of the energy producing sector. In fact, the decline in energy prices is tantamount to expanding the aggregate supply capabilities of the domestic economy. For any given monetary policy, this is likely to result in a dampening of any inflationary pressures as an expansion of the output of goods from the economy gets "chased" by a given amount of money. This effect, however, has the attributes of a one-shot episode: the economy's general price level will adjust to the new level of aggregate supply, but once the adjustment takes place, further deflationary pressure would have to come from still further declines in oil prices.

III. POLICY DIMENSIONS OF THE DECLINE IN WORLD OIL PRICES

Two of the clearest consequences of declining world oil prices are: 1) reduced investment in supply by the domestic energy producing sector, and 2) reduced incentives for energy conservation by the users of energy products. These responses, in turn, raise a number of issues for energy policy. First, does the nation bear increased risks of international supply disruptions by failing to develop its domestic energy resources above the level that is dictated by marketplace price incentives? Clearly, current world oil prices will completely eliminate any incentives for the development of exotic alternatives to traditional oil, gas, coal, hydro, and nuclear energy supplies. But current prices also depress development efforts in the traditional sectors. Second, is the nation facing the possibility that consumers will myopically believe that energy prices will never rise again and that energy conservation is a thing of the past? Could reduced energy efficiency set the stage for another Energy Crisis?

At first glance, the "obvious" solution to these problems might appear to be the imposition of an oil (crude and products) import tariff -- were these problems real. A tariff would prop up both producer and consumer prices in the domestic economy and, thereby, spur both domestic resource development and energy conservation. A $5 per barrel import tariff on top of a $14 per barrel world oil price, for example, would increase oil drilling activity (total feet) by 10%-15%; and such a tariff could cut oil consumption by 11%-14%. A tariff of this size would generate net gains for the oil producing industry at the rate of approximately $20 billion per year, but would cost oil users roughly $40 billion per year (not counting any receipt of tariff revenues).

Of course, the facts that an oil import tariff would benefit oil and other domestic energy production and would deter energy consumption are not, in themselves, justification for a tariff. The commonly heard arguments for a tariff noted above -- that lower prices will now cause underinvestment in domestic energy production and wasteful overconsumption of energy products -- are notably weak. First, on the producer side, it is not clear that tariff protection provides a defense against oil supply disruptions or that a tariff provides more effective protection than the Strategic Petroleum Reserve and/or the agreements of the International Energy Agency. The 1973 oil supply shock occurred following almost 15 years of import protection for domestic producers (under the Mandatory Oil Import Program), during which time producers were given incentives to develop domestic supply sources. Moreover, available evidence indicates that drilling activity responds quite quickly to a given price change (such as would accompany an international supply disruption), with the vast majority of the response coming within six months. The rapidity of this response argues against maintaining a "stockpile" of protected producers. Finally, oil developed and produced today is not available tomorrow. Saving domestic supply today may be preferable to current development if imported energy is likely to become more expensive and/or less secure in the future.

On the demand side, it must be stressed that we would not want consumers to be excessively energy efficient. It is appropriate that consumers respond to lower energy prices by consuming more and reducing their efforts to conserve. Energy conservation is not free. It results in the use of capital, labor, materials, engineers and scientists that might be allocated to other sectors of the economy -- from health care to agriculture. If energy, in fact, becomes less scarce and expensive, it is appropriate for the nation to devote less of its resources to conservation in order to improve its output from other sectors of the economy.

The relevant question is, of course, whether the current decline in energy prices is likely to be perceived as more permanent than it really turns out to be. While it is possible that energy users will have expectations biased in this direction, the specter of myopic consumers foolishly returning to pre-1970's consumption patterns is not credible. Not only are the memories of the 1973 and 1979 episodes still present, but there is no obvious reason why consumers' expectations would be likely to be biased in the direction of low prices rather than high prices. In addition, available evidence indicates that significant adjustments to both price increases and price decreases take place only over many years, rather than within days, weeks or months. The nation's energy-using capital stock -- machinery, buildings, automobiles, etc. -- is turned over relatively slowly in response to changes in energy prices. The improvements in energy efficiency put in place since 1973 will not be quickly abandoned in response to a fall in oil prices during the first three months of 1986.

In short, the decline in oil prices is not, itself, the source of arguments for an oil import tariff. Such arguments, to the extent they are defensible on economic grounds, are largely independent of the level of oil prices. In general, defensible arguments arise most credibly from: 1) the ability of the U.S. as a whole (but no individual buyer alone) to lower the cost it bears for importing oil when it restrains the levels of its overall imports, or 2) national security risks associated with any level of dependence on imported oil (i.e., risks associated with, for example, being held "hostage" by a hostile oil exporter). In either of these situations, the full cost the nation bears for imported energy exceeds the price paid by any individual importer -- either because each individual buyer does not see his/her purchases as raising costs to every other buyer, or because individual buyers do not bear all of the national security costs and risks of their private import purchases.

IV. THE OUTLOOK

Assessing the likely duration of recent oil price declines is probably as important as measuring their current economic impact on oil producers and consumers. An appropriate place to start in this regard is with an examination of the factors that have put us where we are today.

At least four significant factors have contributed to the decline in real oil prices shown in Figure 1:

1. First, the sharp oil price increases in the 1970s brought forth extensive efforts to find additional energy supply. While we are all aware of the significant petroleum supplies that come from Alaska, Mexico and the North Sea, the output of non-oil energy sources has also been pushed far above what it would have been had world oil prices remained at pre-embargo levels. The coal deposits, natural gas reserves and international nuclear power plants that have now been explored and/or developed will continue to overhang the oil market and restrain prices.
2. A second factor contributing to declining real oil prices in the 1980s has been the conservation efforts induced by the rising prices of the 1970s. The U.S. and most other nations adjusted gradually, but steadily, to higher oil prices from 1973 onward by raising the efficiency of energy consumption (e.g., as measured by btus per dollar of output). The result is now oil (and other fuel) demand that is substantially lower at any given price than it otherwise would have been. As noted, the movement toward energy conservation is not likely to be quickly wiped out by lower prices.

3. A third factor contributing to the decline in oil prices has been the elimination of U.S. price ceilings on oil and natural gas. The elimination of price controls on oil and (partially) on natural gas increased domestic supplies of these resources relative to what they would have otherwise been. In the case of oil, decontrol appears to have raised output by as much as 15% over what it otherwise would have been. Oil and gas price decontrol also increased the responsiveness of domestic energy supplies to world market conditions. The ability to respond to higher world prices by increasing domestic output acts to constrain the actions of any oil exporting country contemplating an exercise of market power.

4. The preceding factors have contributed to the downward trend in oil prices that has operated since 1980. They do not, however, provide a full explanation for the very sharp drop in oil prices over the last two months. The key to this event appears to have been Saudi Arabia. Since the Iranian revolution in 1979, Saudi Arabia has been the dominant player in the world oil market and has been primarily responsible for controlling the level of world oil prices by consciously limiting its output of crude oil. By late 1985, however, Saudi Arabia found its revenue needs exceeding its revenue collections -- it was running a deficit. Rather than borrow to finance its spending, Saudi Arabia has apparently decided to raise revenue by selling more oil. The resulting impact on oil prices is why we are here today.

In light of the factors that have led to the current state of world oil markets, what is the outlook for oil prices now? Over the short term, I hesitate to guess where prices will settle. Nevertheless, the keys appear to be the supply behavior of Saudi Arabia and its competitors in the world energy markets. As long as Saudi Arabia does not continue to raise its output, the disincentives to supply embodied in current prices should, on net, discourage production of coal, natural gas and non-Saudi oil (particularly production by private sector firms not facing mandated revenue targets). This will cause prices to firm. Over the longer term, the predictable components of oil supply and demand point to prices that rise at moderate rates of, say, 3% per year (in constant dollars).

The longer term outlook for energy prices is predicated on several factors. First, rising prices are likely to be needed to continue to call forth new oil and non-oil supply sources. Second, relatively low energy prices in the near term will tend to slow or reverse consumers' conservation efforts. Gradually, this process will lead to higher demands than would otherwise arise. These higher demands will put upward pressure on oil prices. Third, this pressure will be complemented by generally positive world economic growth. The demand for petroleum products is quite sensitive to aggregate economic growth, and the outlook for oil prices is linked to GNP growth around the world.

Needless to say, there are major uncertainties that are hard to factor into forecasts of oil prices. One of these uncertainties is clearly Saudi Arabia. The Saudis have (and recognize that they have) the ability to directly affect world oil prices by varying their production levels. Indeed, too much appears to be made regarding the disarray and demise of OPEC. While Saudi Arabia would undoubtedly welcome the cooperation of other OPEC and non-OPEC oil suppliers, the Saudis do not require such cooperation to exercise market power over price. Should the Saudis' current revenue needs recede, or should they be willing to finance their expenditure goals through borrowing or sales of non-oil assets, the Saudis could be expected to significantly cut their crude oil output. World oil prices could then be expected to rise as fast as they have recently fallen. On the other hand, price could easily be driven below current levels by further increases in Saudi output -- perhaps motivated by still unfilled revenue targets.

The influence of unanticipated changes in Saudi Arabian production behavior on world oil prices could be either upward or downward. Clearly pushing prices in an upward direction, however, would be a disruption in Middle Eastern oil supplies. Such a disruption might emanate from political or military turmoil and seems unlikely to be eliminated as a possibility over the foreseeable future. Over the longer term, in fact, the Middle East is likely to play an increasingly important role in the world oil market. While the expansion of oil and non-oil energy supply sources outside of OPEC has been a recent source of softer world oil prices, the Middle East continues to be the site of a very large share of the world's liquid energy. Over time, it is likely to be the case that oil production will become more, rather than less, concentrated in the Middle East. This will facilitate control over prices by Saudi Arabia, a rejuvenated OPEC, or a hostile interdictor.

On the side of lower prices, one hard-to-predict possibility is an end to the Iran-Iraq war. Each of these countries is producing far below the levels they would be likely to select if they were at peace (given time to repair existing production facilities and invest in new facilities). Several million barrels of additional crude oil output from Iran and Iraq would significantly reduce world prices and stem their rise.

Obviously, the course of oil prices will depend on factors that are inherently hard to predict. The course of the Iran-Iraq war or the finance decisions of Saudi Arabia are fundamentally beyond the scope of economists. Unfortunately, this observation does not make the job of this committee any easier.

Representative **Lungren**. Now we will hear from Mr. Edward Friedman from Shearson Lehman Bros.

STATEMENT OF EDWARD FRIEDMAN, SHEARSON LEHMAN BROS.

Mr. **Friedman**. I came with a long prepared statement that goes into the record, apparently, and I have a summary statement.

I think we are all in agreement that the large decline in spot oil prices is unmistakably a big event. In sheer size it corresponds to the quadrupling of oil prices in 1973-74, but in reverse. Happily, whereas these increases were damaging to the U.S. economy, the recent decline will likely turn out to be beneficial.

I think we are in agreement that the decline is not random and it is not likely to be reversed soon. It is the result of a conscious policy on the part of Saudi Arabia to boost production in order to regain market share.

The net effects on the U.S. economy and those of other industrialized nations are mostly positive. Energy costs represent about 12 percent of the total market basket in the CPI and therefore as they fall, they will contribute directly to lower overall consumer price inflation.

Indirectly, though, there will be further benefits on the inflation front. Petroleum byproducts include plastics and organic chemicals. They are used to manufacture everything from clothes to cars. Lower input costs into production of everything from clothes to cars helps to contain price increases at the retail level.

The consumer sector will be helped out in that smaller outlays by consumers for gasoline and heating oil will free up funds for discretionary spending on other goods and services.

The international trade balance stands to benefit as well. If we import 4 million barrels a day of oil, which is a low figure, an $8 decline in spot crude prices quickly translates into an $11 billion improvement in the current account deficit.

The impact on interest rates is to push them downward, especially in the long end of the yield curve insofar as it is the expectations of lower inflation which contribute to the lower interest rates. Thirty-year Treasuries, for example, have declined 200 basis points over the last 3 months, to the low 8 percent range. Most of that is not attributed to oil so much as it is attributed to other factors: Gramm-Rudman deficit reduction measures, and so forth. But the lower oil prices also contribute.

The combination of lower home heating costs and interest costs should prove particularly favorable for the housing market.

Interestingly, lower oil prices will even help to lower the Federal deficit in three ways.

First, stronger overall growth in the economy translates into higher personal income and corporate profits, which means higher tax revenues.

Second, lower inflation in the costs of goods and services procured by the Federal Government helps agencies stay within their budgets and reduces the growth of COLA's and entitlements.

Third, lower interest rates can reduce the cost of servicing the national debt. A 1 percentage point reduction in the interest rate on Treasury securities lowers the annual interest paid on $1.5 trillion in national debt by $15 billion.

The negative side of lower oil prices is narrowly focused. High cost oil exporters such as Mexico, Nigeria, Venezuela, Great Britain, and Norway face declines in export revenues. Similarly, high cost U.S. producers. Consequently, incomes of States such as Texas and Oklahoma will be adversely affected. Therefore, so will the tax revenues of those States. Banks with heavy exposure to those companies, nations, and/or regions may suffer.

Shearson Lehman Bros. has an econometric model of the U.S. economy which we have run the lower oil prices through. Over the next 3 years, inflation is likely to average 1 to 1.5 percentage points lower per year than it otherwise would have been, with the biggest improvement this year. Real GNP growth is likely to be about 0.5 percent, upward to 1 percentage point faster each year, with the biggest extra kick next year.

The average annual improvement in the Federal deficit is estimated to be about $24 billion, with the biggest improvement coming in 1988. That improvement, in other words, gradually grows from this year through 1987 to the $30 billion range in 1988.

The unemployment rate should average about one-half of 1 percent per year lower, and that again should be especially seen in 1987 and 1988.

When all the competing forces have left their mark on interest rates, long-term bond rates should stand about 50 basis points lower than they otherwise would have been if oil prices had not dropped.

Thank you very much.

Representative LUNGREN. Thank you very much.

[The prepared statement of Mr. Friedman follows:]

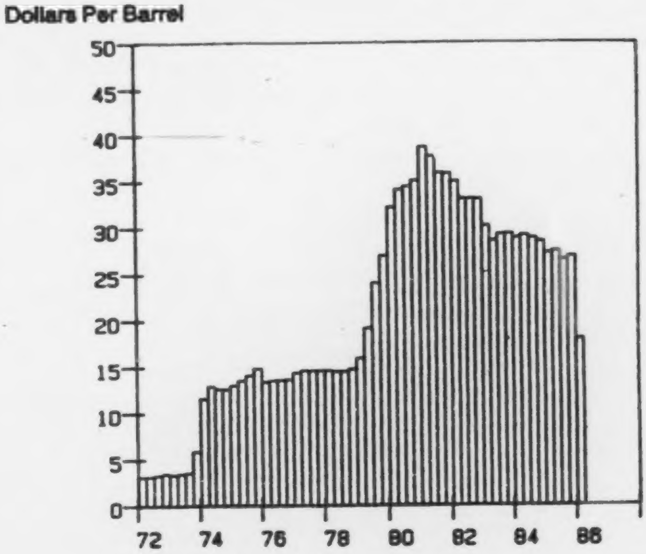
PREPARED STATEMENT OF EDWARD FRIEDMAN

Oil and the Economy: A Big Event*

by Allen Sinai and Edward Friedman

Oil and energy prices, when they change sharply, constitute a big event. Twice since 1970, between October 1973 and February 1974 and from March 1979 to March 1980, there were large inflationary oil price shocks that had far-reaching effects--a quadrupling, then a doubling of oil prices. In more recent years, oil prices have headed downward, falling $5.18 between January 1981 and January 1983, and another $5.40 between January 1983 and December 1985 (Chart 1 and Table 1).

Chart 1
Refiners' Acquisition Cost: 1972 to the Present**



** Average cost in $/barrel to U.S. refiners from foreign sources

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*Shearson Lehman Brothers Bulletin Series. No. 38. 2/19/86

Table 1
Largest Monthly Movements in Oil Prices

	Refiners' Acquisition Cost ($/Barrel)	Change from Previous Month ($/Barrel)
January 1986*	22.00	- 4.00
March 1983	28.43	- 2.33
January 1983	31.40	- 1.45
April 1982	32.82	- 1.25
March 1982	34.07	- 1.41
January 1981	36.58	+ 3.22
March 1980	33.42	+ 1.02
February 1980	32.40	+ 1.65
January 1980	20.75	+ 1.84
December 1979	28.91	+ 1.89
November 1979	27.02	+ 1.97
September 1979	25.06	+ 1.08
August 1979	23.98	+ 0.89
July 1979	23.09	+ 2.06
June 1979	21.03	+ 2.03
May 1979	19.00	+ 1.42
April 1979	17.58	+ 1.17
February 1974	12.45	+ 2.86
November 1973	9.59	+ 6.36

*Estimated

Most recently, crude oil prices have collapsed in the aftermath of a new pricing strategy by OPEC--especially Saudi Arabia-- increasing production to gain market share. The latest moves in oil prices have been huge, some $3 to $12 of reductions in crude oil spot prices and an estimated $7 drop in refiners' acquisition cost. The latest change is the third largest since 1970 and thus, by any definition, is a big event.

The first oil price shock in 1973-74 and a second in 1979-80 were major factors in the double-digit inflation rates of the late 1970s and early 1980s, soaring interest rates, and the weakness of the dollar. The oil and energy price shocks were also of prime importance in the 1970s' stagflation--sluggish growth, frequent economic downturns, high unemployment, and high inflation.

Now the oil cartel that created these conditions has broken apart, and the results of cartel-breakdown theory are appearing. Various crude oil prices are down $10 to $15 a barrel since mid-December 1985, and trading in some oil markets has ground to a halt (Tables 2 and 3). The declines are beginning to show in lower gasoline prices at the pump and in reductions of heating costs. The Producers' Price Index (PPI) for January has already showed a large 0.7% decline, to a great extent the result of these price declines. Other price indexes will soon start to show the flow-through effects of falling energy prices, producing surprisingly low inflation rates.

What are the economic effects of lower oil prices, both qualitative and quantitative, for the U.S. and the rest-of-the-world economies? This analysis answers these questions, with the aid of the Shearson Lehman econometric model of the U.S. economy--a 300-equation macroeconometric model that contains considerable detail on inflation in the contemporary economy. It should be noted that the results are suggestive, rather than definitive, given the nature and shortcomings of econometric-based analyses. Also, the behavior of oil prices, a key exogenous input to the system, is very volatile and subject to the vagaries of Mideast oil politics, injecting considerable uncertainty into the results.

Oil Prices & the Economy--Qualitative Effects

Lower oil prices, if they persist, are classified as a disinflationary shock. Inflation is directly lowered, real economic growth is raised, and the lower oil prices are a force for lower interest rates. Policymakers have more room to maneuver as a result of the lower inflation, particularly for monetary policies to be more accommodative. Lower oil and energy prices reduce business costs and help raise corporate profits. The lower inflation reduces federal budget deficits by lowering government outlays and raising tax receipts.[1] But, the lower oil prices also can bring a host of negative effects for certain countries, regions, and financial institutions whose businesses are tied to oil production and revenues and oil-related economic activities. These effects are true generally for the U.S. as well as the rest of the world.

Oil Prices & The Economy--The Process

First, reductions in crude oil prices in the spot and futures markets directly reduce inflation, although initially with lags of one to three months. Impacts occur on oil and energy costs, the prices of derivative products such as plastics and chemicals, and eventually even the prices on items like airline fares and automobiles. The deflationary effects show up first in the Producers' Price Index, then in the Consumer Price Index, and last in the implicit GNP price deflator. Inflation is affected more in the PPI, which reflects commodities prices, and less in the GNP price deflator, which is heavily services oriented. The bulk of the disinflationary effects appear two to six months after the initial crude oil price declines, and taper off after that.

Table 2
Recent Performance of Key Spot Oil Prices
(Monthly Averages, Unless Specified)

	1986	1985											
	Jan	Dec	Nov	Oct	Sep	Aug	Jul	Jun	May	Apr	Mar	Feb	Jan
Indonesia Minas 34	24.57	25.60	25.60	25.60	25.42	25.39	25.56	25.76	26.16	26.71	26.67	26.65	26.82
% chg.	−4.0	0.0	0.0	0.7	0.1	−0.6	−0.8	−1.5	−2.1	0.1	0.1	−0.6	−0.9
% chg. year ago	−8.4	−5.4	−6.7	−8.2	−1.2	−10.1	−9.9	−9.1	−8.5	−5.7	−2.7	−3.7	−3.5
Nigeria Forcados 31	22.92	27.29	29.96	28.89	28.29	27.67	26.61	26.41	26.77	27.96	28.12	28.21	27.11
% chg.	−16.0	−8.9	3.7	2.2	2.1	4.0	0.7	−1.3	−4.2	−0.6	−0.3	4.0	−1.0
% chg. year ago	−15.5	−0.4	7.5	2.4	−0.7	−1.9	−5.4	−10.0	−9.9	−6.5	−5.7	−4.8	−7.3
UK Brent 36.5	21.65	26.35	29.87	28.60	27.71	27.41	26.70	26.44	26.70	27.70	28.14	28.18	26.95
% chg.	−17.8	−11.8	4.4	3.2	1.1	2.7	1.0	−0.9	−3.6	−1.6	−0.2	4.6	0.0
% chg. year ago	−19.7	−2.2	7.8	2.6	−2.3	−2.6	−4.2	−8.8	−10.5	−7.5	−6.3	−5.2	−8.7
West Texas Intermediate	21.91	25.57	29.05	27.41	27.38	27.16	26.38	25.82	26.73	28.17	28.23	28.06	26.07
% chg.	−14.3	−12.0	6.0	0.1	0.8	2.9	2.2	−3.4	−5.1	−0.2	0.8	7.7	−1.1
% chg. year ago	−16.0	−3.0	5.1	−2.0	−4.0	−4.9	−6.7	−11.5	−9.1	−4.2	−4.9	−3.0	−8.7
U.S. Refiners' Acquisition Cost	22.0*	26.00*	26.80	26.63	26.59	26.62	26.46	27.27	27.82	27.61	27.23	27.05	27.51
% chg.	−15.4	−3.0	−0.6	−0.1	0.1	0.6	−3.0	−1.3	0.0	1.3	0.6	−1.6	−1.8
% chg. year ago	−20.0	−7.1	−6.9	−7.3	−7.4	−7.9	−8.8	−6.6	−5.6	−5.1	−5.9	−6.4	−4.5

*Estimate

Saudi Arabian and Venezuelan spot prices are not shown because they are on a netback basis and comparisons would not be meaningful.

Table 3
Recent Performance of Key Spot Oil Prices
(Weekly Averages, Unless Specified)

	1986							1985					Cumulative Decline Since 12/6
	2/19 (Latest)	2/7	1/31	1/24	1/17	1/10	1/3	12/27	12/20	12/13	12/6	11/29	
Indonesia Minas 34	16.30	22.25	22.25	24.60	25.40	25.60	25.60	25.60	25.60	25.60	25.60	25.60	−12.1%
% chg.		0.0	−9.6	−3.1	−0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
% chg. year ago		−16.5	−16.7	−7.7	−5.6	−4.8	−5.4	−5.4	−5.4	−5.4	−5.4	−6.6	
Nigeria Forcado 31	17.50	18.20	19.30	19.70	24.25	26.75	26.85	26.80	26.45	27.00	29.50	30.40	−42.0%
% chg.		−5.7	−2.0	−18.8	−9.3	−0.4	0.2	1.3	−2.0	−8.3	−3.1	0.0	
% chg. year ago		−35.0	−29.3	−27.8	−10.2	−0.9	−0.2	−2.2	−3.5	−1.8	7.1	11.2	
UK Brent	16.50	18.00	18.50	18.55	22.50	25.20	26.00	25.96	25.75	26.15	28.00	30.40	−40.3%
% chg.		−2.7	−0.3	−17.6	−10.7	−3.1	0.2	0.8	−1.5	−6.6	−7.9	−0.7	
% chg. year ago		−37.5	−33.9	−30.7	−16.6	−5.3	−1.3	−3.5	−3.6	−3.0	1.7	11.6	
West Texas Intermediate	14.70	15.75	18.90	18.90	23.05	25.40	25.10	24.85	25.45	25.45	27.00	29.30	−41.7%
% chg.		−16.7	0.0	−18.0	−9.3	1.2	1.0	−2.4	0.0	−5.7	−7.8	−1.2	
% chg. year ago		−43.2	−28.7	−28.1	−11.9	−0.9	−2.1	−5.3	−2.1	−3.3	−0.7	8.7	

Saudi Arabian and Venezuelan spot prices are not shown because they are on a netback basis and comparisons would not be meaningful.

Second, the lower inflation raises consumer purchasing power by increasing real disposable income and the funds available for discretionary spending. The lower inflation also reduces interest rates, inducing the refinancing of old debt to cut servicing costs. This is true for households, businesses, and even government entities. Business costs are also lower, raising profits and cash flow. The end result is an increase in real economic growth as various sectors spend more out of the higher cash flows.

Third, if the decline in oil prices is expected to be permanent, the expected rate of inflation will come down. This helps to lower long-term interest rates. Less demand for borrowed funds results from actual lower inflation and tends to reduce short- term interest rates. In addition, the central bank has more leeway to stimulate growth without worrying about excessive monetary growth and inflation, and can be another source of lower interest rates.

All of these factors are the way lower oil prices can translate to lower interest rates.

Fourth, federal budget deficits should decline as a consequence of lower oil prices. More economic growth means additional tax revenues from individuals and businesses, more than offsetting any decline in windfall-oil tax receipts or taxes from oil- related businesses. Less inflation also means lower government outlays, especially in COLAs and entitlements. And, the lower interest rates that stem from lower inflation reduce the debt service costs to the federal government--now, the third largest government expenditure category. State and local government tax receipts should be higher as well, and operating costs lower.

Fifth, the so-called "Phillips Curve"--the relation between inflation and unemployment--should shift lower from a lower oil price shock. This means that both inflation and unemployment can be reduced simultaneously for a given growth path of real GNP, productivity, and other factors that affect inflation such as the dollar. The fall in oil prices directly reduces inflation and the increase in real economic growth reduces unemployment. Deflationary oil price shocks, for the time being, vitiate the trade-off between inflation and unemployment. Slack in the economy need not be created to reduce inflation--higher inflation need not result as a consequence of a lower rate of unemployment.

All these positive results are generally true for the rest of the world as well as for the United States--even for those oil-exporting countries that are directly hurt by lower oil prices. Lower inflation; increased economic growth, income and profits; lower interest rates; improved budget positions for governments; more leeway for stimulative monetary policies, if necessary; and lower unemployment can be expected.

The negative fallout from oil lower prices is more narrowly focused. Oil exporters like Mexico, Nigeria, Venezuela, Ecuador, Great Britain, Norway, and most OPEC countries (an exception is Saudi Arabia) face steep declines in export revenues. Only those countries with low marginal costs of oil production, considerable capacity to expand, and modest domestic expenditures can benefit from a situation of falling oil prices in the short and intermediate term. Oil-producing regions in this country like Texas, Oklahoma, and Louisiana will also be hard hit, as revenues to state and local governments drop. Oil companies, especially those concentrated in oil production as opposed to distribution, will be hurt. And, those banks located in regions where oil makes up a major economic activity, with large energy loans in portfolios, significant LDC debts, or that have not reserved enough against loan losses will suffer.

Oil & The Economy--The Quantitative Impacts

Shearson Lehman Economics has examined the macroeconomic consequences of lower oil prices using a large-scale macroeconometric model of the U.S. economy--the Shearson-Lehman 300-equation model. In the computer simulations, a $10 per barrel drop in refiners' acquisition cost of crude oil is assumed. This decline is a little more than has actually occurred so far (Table 3). The drop in the refiners' acquisition cost of oil is estimated to be about $7 up to the end of February. The results shown in Table 4 below are a useful indication of the incremental effects of an oil price drop relative to a situation without the $10 a barrel decline.

The $10 per barrel reduction in refiners' acquisition cost, if sustained, reduces inflation by 1.5 to 2.8 percentage points in the first year, depending on the particular price index involved, and 1.3 to 2.4 percentage points below what otherwise might have occurred in the second year. This result takes into account all other feedback effects from the lower oil prices, including the impacts on economic growth, interest rates, the exchange rate, and wages. The monetary authority is assumed to maintain the same path for nonborrowed reserves before and after the oil price shock.

Real GNP growth rises 0.8 percentage point in year 1, according to the computer simulation. In the second year after the drop in oil prices, real growth is 1.4 percentage points higher. There are time lags before the increased purchasing power of households and business translates into additional expenditures that raise real GNP.

Table 4

Economic and Financial Impacts of Lower Oil Prices* (Incremental Changes Relative to No Oil Price Decline)

	1986	1987	1988
Inflation (Percent Change)			
CPI-U	-2.4	-1.6	-0.6
Implicit GNP Deflator	-1.5	-1.3	-0.8
Producers' Price Index	-2.8	-2.4	-0.2
Real GNP Growth (Percent Change)	0.8	1.4	0.7
Unemployment Rate (Percent)	-0.2	-0.6	-0.6
90-Day Treasury Bill Rate (Basis Points)	-34	-37	-46
30-Year Treasury Bond Rate (Basis Points)	-35	-50	-67
Budget Deficit - NIPA** (Bils. of Dollars)	12.3	24.9	38.5
Trade-Weighted Exchange Rate (Percent Change)	4.4	-2.8	-1.4
M1 Growth (Percent Change)	0.1	-0.2	0.1
M2 Growth (Percent Change)	0.7	0.5	-0.1
Corporate Profits, After-tax (Percent Change)	2.4	0.8	0.2

* Computer simulation with the Shearson Lehman Model of the U.S. Economy. The results of computer simulations with econometric models should be regarded as approximate, reflecting one of a large distribution of outcomes of the simulated changes. The more ahistorical the simulated change, the more uncertain the results.

** Includes reductions in windfall profits taxes.

The unemployment rate is 0.2 percentage point lower in 1986 and 0.6 percentage point below the no-oil price decline situation in later years. The increased final demands resulting from the lower inflation raise employment in the economy, producing a lower rate of unemployment despite the drop in inflation. This result reflects the downward shift in the Phillips Curve from the lower oil price shock.

Short- and long-term interest rates drop by 35 to 67 basis points. The lower inflation causes a reduction in the expected rate of inflation which, in turn, reduces the inflation premiums in the 30-year Treasury bond rate. Short-term interest rates are down from a reduction in the current-dollar demand for funds by households and business.

After-tax corporate profits grow faster, some 2.4 percentage points higher than otherwise would be the case in the first year of the lower oil price shock, and 0.8 percentage point in the second year. Lower costs and increased sales bring about the improvement.

Surprisingly, perhaps, the federal budget deficit improves by $15.3 billion in calendar 1986, $27.9 billion in 1987, and $41.5 billion in 1988. The 0.8 and 1.4 percentage point increases in real economic growth bring more tax revenues to the federal government. The sharp declines in inflation save the federal government in reduced current-dollar outlays. The reductions of interest rates also help to reduce the federal budget deficit by limiting the interest payments on outstanding federal government debt. Thus, the lower oil prices make the task of deficit reduction in Washington easier.

Summary

In the broad sweep of history, what we see in the latest oil event is the price mechanism at work. The shock of higher oil prices in the 1970s was a major source of slow growth, high inflation, and high unemployment around the world. But that shock also set up longer-run shifts in energy supplies and demands that have helped bring a collapse in the OPEC cartel and of oil prices. Higher oil prices induced major shifts in production technology and consumer habits that reduced energy usage and demand, although with long lags. At the same time, the price increases stimulated new sources of oil and energy production around the world. These changes ultimately reversed the demand and supply imbalances that permitted oil prices to rise in the first place. Mideast oil politics have dictated the rest. Saudi Arabia has increased supply in order to increase oil revenues. That in turn forced down prices which is causing some marginal production to be shut down and in the long run will cause demand to rise.

The U.S. and world economies are now in the middle of the momentum from the latest oil event. History teaches that, once started, such an event will continue to run. The processes of the latest declines in oil prices and oil politics need to play out over a year or so before any reversal might begin. The elasticities of response to lower oil prices in demands and supplies are significant in the long run, but slow in unfolding and perhaps asymmetrical compared with the effects from higher oil prices.

Only if politics intervene--a rapprochement between the Saudis, other OPEC members or non-OPEC oil-producers, or a conflict in the Middle East or other oil-producing regions--might the current trends be reversed. Even then, the fundamental demand and supply conditions that favor lower oil prices probably would remain, preventing any return of oil prices back to the mid $20s or above prior to 1989 or 1990.

This "big event" is a lucky break for most economies. Lower oil prices mean lots of good news for the economy and financial markets; a boost in the real aftertax returns on financial assets in most countries; a positive step towards prosperity, lower unemployment, and lower interest rates; and a growing perception of less inflation in future years. All this will be a big plus for bonds and stocks, though most likely better for the equity than the bond markets, but the latter will benefit greatly as well. The lower oil price event sets a resilient backdrop for the financial markets, permitting improvement even if other news is negative.

Footnotes

*Based on a speech presented by Allen Sinai entitled "Oil and the Macroeconomic Impacts," at the New York Mercantile Exchange Symposium, Options, Implications and Outlook for Today's Oil Markets, Wednesday, February 12, 1986.

[1] An exception in the U.S. is the windfall profits tax, which, in the case of the lower oil prices so far, would decline by approximately $3 billion.

Representative **Lungren**. Now we will hear from Mr. Joel Prakken of Laurence Meyer & Associates.

STATEMENT OF JOEL L. PRAKKEN, LAURENCE MEYER & ASSOCIATES

Mr. **Prakken**. Thank you, Congressman Lungren. It is a pleasure to have this opportunity to share with the subcommittee my views on the ramification for the national economy of declines in petroleum prices.

I will limit my comments to the overall economic effects of the oil prices and where I think it is important to try to draw some distinctions between the conclusions that we have reached and some that I have heard expressed by my other colleagues on the panel.

While falling oil prices do provide a welcome contrast to our experience of the 1970's, a decade in which we witnessed a nearly tenfold increase in the price of petroleum relative to the overall price level, I think it is important that we not forget that recent reductions in oil prices reflect a decline in the relative price of energy associated with the changing structure in the worldwide market for petroleum.

We are all taught in introductory economics that the principal factor in determining inflation in the long run is the rate of growth in the Nation's money stock. Hence, I think it is safe to say that if the economy is operating near potential and for a given path in the Nation's money supply there may be little lasting advantageous effect upon either the overall price of domestically produced output or the real value of domestically produced output.

Nonetheless, during and for some time following a drop in the price of oil we should enjoy a temporary reduction in domestic prices below levels associated with higher energy costs accompanied by a temporary rise in domestic output as the effects of lower real energy prices permeate our economic structure.

Estimates prepared by my colleagues at Laurence Meyer & Associates reveal that while 7 years later the level of real GNP is practically unaltered following a one-time $5 reduction in the price of oil, in the interim there is a cumulative increase in the value of domestic production of about $155 billion, which comes to something just over 4 percent of 1985's GNP.

Some handy rules of thumb here. Our estimates suggest that for every one-time drop in the price of oil of $5 that growth in real GNP is raised initially in the first year by about half a percentage point and maybe by half that amount in the second year, and that the inflation rate, measured by growth in the consumer price index, is lower by sixth-tenths of a point in the first year and only a few tenths after that. Private nonfarm employment could be up as much as 700,000 after 2 years.

Furthermore, since the decline in the relative price of oil reflects improved terms of trade faced by American consumers vis-a-vis oil exporting nations, our ability to consume is enhanced even for an unchanged level of domestic production, and this clearly has been a development that is in favor of our consumers. We estimate that for a one-time $5 decline in the price of imported petroleum that real wages in the private nonfarm sector will rise by about three-tenths of 1 percent in the first year, and this differential persists and, indeed, grows over the 7-year horizon that we examined.

Nonetheless, over periods longer than 2 or 3 years, many of the transitory beneficial effects of the decline in the relative price of oil begin to reverse themselves: stronger near-term growth in GNP starts to absorb the economy's unutilized resources; the employment rate starts falling; we start taking up slack in our output markets, putting upward pressure on wages and prices. For a given path in the nominal money stock the rate of growth in the real money supply declines and higher interest rates start to squeeze out the extra economic growth that you initially had.

There are, however, net advantages to lower oil prices. I think we would all agree with that.

First of all, as I mentioned earlier, for an unchanged level of domestically generated income and production but improved terms of trade vis-a-vis oil exporting nations, American consumers will be able to purchase more goods and services than if the price of oil had not fallen. Typically we measure our standard of living by our ability to consume, and here is a case where we would be able to consume more now without having to give up more later. That is, the real wage measured in terms of consumer prices rises and the increase will persist.

Second, as I have already mentioned, over the period during which GNP remains above the path associated with the higher price of oil there is a cumulative gain in the value of domestic production that is not inconsequential and need not be reversed.

Finally, an argument can be made that in the long run lower energy prices will raise the level of potential output. That is, the value of domestic production at full employment, if you will, by reducing the cost of a factor of production complementary to labor. In this case the recent decline in the price of oil could lead to a one-time rise in domestic production but certainly not a lasting increase in the rate of growth of real GNP. In order for a situation like that to persist you have to have continuing declines in real energy prices in order to have continuing increases in GNP above a level associated with higher energy prices.

I also think that there are some important caveats that we ought to make clear when we are looking at this situation.

The first is the results that I have discussed—and I would assume there are other macroeconomic results presented—have to make some kind of assumption about the Federal Reserve's response to lower oil prices.

In my particular rules of thumb that I have given you, I have assumed that the Fed does nothing, simply keeps the money supply growing at about the same rate that it would have at higher prices. I conclude here that the results assume that the Fed maintains an unchanged rate of growth in the money supply in the face of declining oil prices.

Indeed, the entire calculus of the benefits of lower oil prices depends crucially on the response of monetary authorities. If the Fed, pursuing further reductions in underlying inflation, uses the opportunity provided by falling energy prices to reduce monetary growth while avoiding a deceleration in output, the beneficial aspects of OPEC's demise would be largely offset.

Nor should it be forgotten that while our overall economy benefits from lower energy prices, there are obviously domestic winners and losers. As a general proposition consumers gain because the terms of trade they face vis-a-vis oil exporting nations has improved. Producers in the petroleum and closely related industries are clearly going to lose. The distribution of gains and losses are not distributed evenly over geographic areas either, oil producing regions bearing disproportionately large losses and enjoying disproportionately small gains.

Finally, a precipitous drop in oil prices places increased financial pressure on oil producing nations encountering difficulties meeting interest obligations to Western banks. This could adversely affect U.S. exports, undermining some of the potential gains from cheaper energy. Furthermore, defaults by such countries on bank loans could threaten the stability of our financial system with deleterious implications for the real economy as well.

While this potential threat is appropriately viewed, in my judgment, as a problem encountered temporarily in the economic transition to lower oil prices, it is going to greatly complicate the tasks facing the monetary authorities here over the next couple of years.

In sum, I think there can be no doubt that unless the Fed moves to counter the beneficial effects of lower oil prices in the near term, we will all enjoy it. At least American consumers will certainly be better off in the face of lower oil prices.

I think the longrun beneficial aspects of this have been largely oversold. The only two clear longrun benefits that I can see from this are an increased ability of our consumers to purchase more goods and services because of a shift in the terms of trade against oil exporting nations. This will persist, assuming that real oil prices will not start rising again, and then lower oil prices will slightly increase the rate of growth and potential output that the economy can achieve over long periods of time.

I think it is a fair statement that most economists would argue that the principal reason that potential output increases is because the labor force is growing and because the capital stock is growing and that energy would play probably a tertiary role in that particular set of calculations.

I guess my concluding comments here are that it is good news in the short run, but maybe I am going to temper the comments of my other colleagues with a little bit of longrun caution.

Representative LUNGREN. Thank you very much.

[The prepared statement of Mr. Prakken follows:]

PREPARED STATEMENT OF JOEL L. PRAKKEN

Oil Prices and Macroeconomic Performance

Opening Remarks

Mr. Chairman, it is a pleasure to have this opportunity to share with the Committee my views on the ramifications for the national economy of declines in the worldwide price of petroleum.

While falling oil prices provide a welcome contrast to our experience of the 1970s, a decade which witnessed a nearly ten fold increase in the price of petroleum relative to the overall price level, we should not forget that recent reductions in oil prices reflect a decline in the *relative* price of energy associated with a changing structure in worldwide market for petroleum. Hence, if the economy is operating near potential, and for a given path of the nation's money supply, there may be little *lasting* advantageous effect upon either the overall price of *domestically* produced output (i.e., the implicit deflator for Gross National Product) or the real value of domestically produced output (i.e., the real Gross National Product).

Nonetheless, during and for some time following a drop in the price of oil, we should enjoy a *temporary* reduction in domestic prices (below levels associated with higher energy costs) accompanied by a *temporary* rise in domestic output as the effects of lower real energy prices permeate our economic structure. Estimates prepared by Laurence H. Meyer and Associates (LHM&A) reveal that while , seven years later, the level of real GNP is practically unaltered by a one-time $5 decline in the price of oil, the cumulative interim increase in the value of domestic production is $155 billion, or 4.3% of real GNP in 1985.

Furthermore, since the decline in the relative price of oil reflects improved terms of trade faced by American consumers vis-a-vis oil exporting nations, our ability to consume is enhanced even for an unchanged level of domestically generated output. LHM&A estimates that, for a one-time $5 decline in the price of imported petroleum, real hourly compensation in the private nonfarm sector rises by 0.31% in the first year, a differential that rises to 1% persists seven years later.

Channels of Impact: The Near Term Gains

The decline in the price of oil, attributable largely to the inability of the Organization of Petroleum Exporting Countries (OPEC) to resist the competitive forces steadily undermining their once near monopoly, affects the American economy through a variety of channels all of which, for a period of several years, prove advantageous:

(1) As the price of OPEC oil declines, the price of petroleum-based products imported by the United States falls, reducing *directly* both the Consumer Price Index (CPI) and the Producer Price Index (PPI), measures which cover imports. The GNP deflator, which measures the price of *domestically* produced output and hence does not cover imports, is not so affected.

(2) However, the declining price of imported petroleum influences domestic producers of energy who, facing worldwide competitive pressures, reduce prices as well. Hence the demise of OPEC affects the GNP deflator, albeit indirectly and somewhat more slowly than either the CPI or the PPI.

(3) Prices in other oil importing countries are similarly reduced, tending to lower prices of nonpetroleum products purchased by Americans from abroad.

(4) In the United States, falling oil prices lower the price of consumer goods, but initially leave unchanged both the level of *nominal* income earned by households in the domestic production of goods and services and the *nominal* value of household net worth. The effect is to raise *real* personal disposable income and *real* household net worth, thereby encouraging an expansion in personal consumption expenditures.

(5) Because the demand for energy-related products is relatively price-inelastic, the decline in the relative price of oil results in a decline in consumer expenditures on oil and a corresponding increase in the real income available for expenditures on other consumer items.

(6) The decline in oil prices lowers production costs directly. In addition, the associated decline in consumer prices help mitigate wage demands, working to lower unit labor costs. Lower costs of production transmit the effect of lower oil prices to the price of domestically produced goods and services.

(7) As prices decelerate for an unchanged path of the nominal money stock, the real supply of money increases and interest rates decline. In turn, the decline in

interest rates stimulates business fixed investment, residential construction, expenditure on consumer durables, and inventory investment.

(8) Falling interest rates also lead to an upward revaluation of equities, raising household net worth and thereby encouraging additional consumer expenditures.

(9) In other oil importing nations, the decline in real petroleum prices reduces overall prices, which further benefits American consumers of foreign products.

(10) The decline in oil prices helps raise real incomes worldwide, stimulating demand for U.S. exports.

Channels of Impact: Long-Term Offsets

Over periods longer than two to three years, many of the transitory macroeconomic advantages of a decline in the relative price of oil begin to reverse themselves. Stronger near-term growth in real GNP absorbs the economy's unutilized resources, putting upward pressure on wages and prices. For a given path in the nominal money stock, the rate of growth in the real supply of money declines, interest rates rise, and real GNP decelerates. Some additional "cycling" of inflation, interest rates, and output can be expected before the influence of the decline in oil prices fully dissipates, leaving aggregate domestic prices and output on much the same paths they would have followed absent any reduction in the relative price of energy.

Net Advantages

Although there may be little long-term effect upon either domestically produced real output or the aggregate domestic price level, this is not to say that collectively we are not "better off" following the decline in the relative price of imported energy.

For an unchanged level of domestically generated income and production, but improved terms of trade vis-a-vis oil exporting nations, American consumers will be able to purchase more goods and services than if the price of oil had not fallen. That is, the real wage, measured in terms of consumers' prices, rises and the increase persists.

In addition, over the period during which real GNP remains above the path associated with a higher price of oil, there is a cumulative gain in the value of domestic production that is not inconsequential.

Finally, an argument can be made that, in the long run, lower energy prices raise the level of potential output -- that is, the value of domestic production at "full employment" -- by reducing the cost of a factor of production complimentary to labor. In this case, the recent decline in the price of oil could lead to a one-time rise in domestic production, but not a lasting increase in the rate of growth of real GNP.

The Baseline Simulation: $20/Barrel of Imported Oil

To gauge the empirical magnitudes of these effects, Laurence H. Meyer and Associates, using the Washington University Macroeconomic Model of the United States Economy, have prepared some representative simulations of the impact of a decline in oil prices on the domestic economy.

The benchmark against which the effects of lower oil prices are measured is a "baseline" simulation in which, from the beginning of 1986 through the end of 1992, the price of imported oil is held at $20 per barrel, real GNP grows at about a 3.2% annual rate, the inflation rate, measured as the rate of change in the All Urban CPI, averages 3.4% per year, and both nominal interest rates and the civilian unemployment rate gradually decline. The baseline simulation, summarized in Table 1, does *not* represent a forecast of future economic activity. Rather, it should be interpreted as a defensible point of reference that is conditional upon the underlying assumptions about monetary and fiscal policy, as well as growth in population and the rate of technological advance. In the baseline simulation, the domestic economy is operating near potential (or "full employment") by the end of the decade.

Alternative #1: $15/Barrel

The first alternative was prepared under the assumption that, in the beginning of 1986, the price of imported oil declines by $5 per barrel down to $15 and remains and that new lower level thereafter. The monetary authorities are assumed to maintain an unchanged path in the nominal money stock (M1). The results of alternative #1 are presented in detail in Table 2.

The results suggest that, over the first full year following the $5 decline in oil prices, the rate of growth in real GNP is raised by half a percentage point, and by three tenths of a point in the second year. The inflation rate, measured as the growth in the CPI, is lowered by six tenths of a percentage point in the first year, and by two tenths of a point in the second year; as suggested by the discussion above, the impact on the rate of change in the GNP deflator is smaller. Private nonfarm employment is up 700,000 after two years, while the civilian unemployment rate is down seven tenths of a percentage point. Interest rates do fall initially, but only marginally so. The reason is that while the decline in inflation *by itself* tends to lower interest rates, the accompanying spurt in real growth tends to offset the decline by placing upward pressure on yields.

As the unemployment rate falls, pressure for increases in wages and prices builds. By 1989, both hourly compensation in the private nonfarm sector and aggregate prices are rising more rapidly than in the baseline, and interest rates are higher as well. The effect is, by the fourth year, to reduce the *rate of growth* in real GNP below that in the baseline. By 1992, the *level* of GNP is practically identical to the level of the baseline and the unemployment rate, movements in which trail movements in GNP, is rising towards the level projected in the baseline simulation.

However, real private nonfarm hourly compensation, measured in terms of consumers' prices, is everywhere higher than in the baseline. The differential stands at 1% percent in 1992, representing a sustained increase in the standard of living over the period. This is reflected in an $25 billion increase in the level of personal consumption expenditures by 1992, most of which was purchased from abroad.

In addition, while the level of real GNP is little changed by 1992, the cumulative gain in domestic output over the period comes to $155 billion, roughly 4% of the real value of domestic production in 1985. There are other less tangible but nonetheless important benefits associated with this cumulative gain in output, perhaps the most important of which is the on-the-job experience gained by worker who otherwise would have gone unemployed.

Alternative #2: $10/Barrel

As a second alternative, the price of oil was dropped to $10 per barrel at the start of 1986 and held there thereafter. Results of this simulation are presented in detail in Table 3. The findings are similar in spirit to the case of a $5 decline in oil prices, though the near-term impacts on inflation and growth in real GNP are proportionately larger.

Rules of Thumb and Concluding Caveats

A handy rule of thumb evident in these results is that, for every $5 decline in the price of oil, growth in real GNP rises 0.5 percentage points over the following year, and by half again as much over the second year; inflation, measured as the rate of growth in consumer prices, falls 0.6 percentage points over the first year, but only 0.2 points in the second.

Finally, the optimistic conclusions presented herein need be tempered by a few words of caution. In the first instance, the results assume that the Federal Reserve maintains an unchanged rate of growth in the money supply in the face of declining oil prices. Indeed, the entire calculus of the benefits of lower oil prices depends crucially on the response of the monetary authorities. If the Fed, pursuing further reductions in underlying inflation, uses the opportunity provided by falling energy prices to reduce monetary growth while avoiding a deceleration of output, the beneficial aspects of OPEC's demise would be largely offset.

Not should it be forgotten that while our overall economy benefits from lower energy prices, there are domestic winners and losers. As a general proposition, consumers gain and producers in the petroleum and closely related industries lose. The distribution of gains and losses are not distributed evenly over geographic areas either, oil-producing regions bearing disproportionately large losses and enjoying disproportionately small gains.

Finally, a precipitous drop in oil prices places increased financial pressure on oil producing nations encountering difficulties meeting interest obligations to Western banks. This could adversely affect U.S. exports, undermining some of the potential gains from cheaper energy. Furthermore, defaults by such countries on bank loans could threaten the stability of our financial system, with deleterious implications for the real economy as well. While this potential threat is appropriately viewed as a problem encountered temporarily in the economic transition to lower oil prices, it would greatly complicate the task facing monetary authorities both in the United States and abroad.

TABLE 1: BASELINE SIMULATION ($20/BARREL)

	1984	1985	1986	1987	1988	1989	1990	1991	1992
Price/Barrel of Oil ($)....	29	28.1	20	20	20	20	20	20	20
IPD, Gross Ntl Product									
Index (1982=100)..........	108.1	111.7	114.6	117.8	121.3	125.1	129.1	133.6	138.6
% Chg Annual Rate.........	4.1	3.1	2.3	2.8	3.1	3.2	3.3	3.5	4
Consumer Price Index									
Index (1967=100)..........	311.1	322.1	331.9	342.7	353.8	365.1	377	389.8	404
% Chg Annual Rate.........	4.1	3.5	3	3.2	3.3	3.2	3.3	3.5	3.9
Real Gross Ntl Product									
Bil of 82 Dollars.........	3492	3571	3674.1	3789.9	3909.2	4034.5	4161.3	4291.9	4419.7
% Chg Annual Rate.........	4.7	2.3	3.5	3	3.1	3.2	3.3	3	3
Pers Consumption Exp.......									
Bil of 1982 Dollars......	2239.8	2313	2364.8	2411.4	2464.6	2524.7	2596.3	2679.7	2768.4
% Chg Annual Rate.........	3.4	3	2.1	2.2	2.2	2.5	3.1	3.2	3.4
Gross Pvt Dom Invest									
Bil of 1982 Dollars......	661.3	648.6	705.4	743.1	783.2	825.4	861.1	892.2	914.2
% Chg Annual Rate.........	14.6	-0.9	10.8	4.3	5.5	5.3	4.4	2.7	2.5
Pvt Nonfarm Employment									
Millions..................	81.8	84.3	87	89	91	93	95.1	97.1	99.2
% Chg Annual Rate.........	4.5	2.8	3	2.1	2.2	2.3	2.2	2.1	2.2
Civ Unemployment Rate (%)..	7.5	7.2	6.5	6.3	6.3	5.9	5.7	5.4	4.8
Pvt Nonfarm Hourly Comp									
Dollars/Hour..............	12.2	12.7	13.2	13.7	14.3	14.9	15.6	16.3	17
% Chg Annual Rate.........	3.8	3.8	3.9	4	4.6	4.4	4.5	4.6	4.7
Corp Profits After Tax.....	144	139.9	138.6	133	133	142.9	156.4	172.5	193.1
Personal Saving Rate.(%)...	6.5	4.6	4.5	5.2	5.4	5.8	6	5.9	5.5
M1 (% Chg Annual Rate).....	5.8	12	6.7	6	5.7	5.3	5.2	5.2	5.3
Treasury Bill Rate (%).....	9.5	7.5	7	6.4	5.9	5.7	5.5	5.5	5.7
AAA Corp Bond Rate (%).....	12.7	11.4	9.5	8.9	8.2	7.8	7.5	7.4	7.4
Real Corp Bond Rate (%)....	5.2	4.6	4.1	4.6	4.7	4.5	4.2	4.2	4.1

* Levels are for annual averages

Source: Laurence H. Meyer & Assoc

TABLE2: JEC ALTERNATIVE #1 ($15/BARREL)

	1984	1985	1986	1987	1988	1989	1990	1991	1992
Price/Barrel of Oil ($)....	29	28.1	15	15	15	15	15	15	15
IPD, Gross Ntl Product									
Index (1982=100)..........	108.1	111.7	114.5	117.4	120.9	124.8	129.2	134	139.3
% Chg Annual Rate.........	4.1	3.1	2.1	2.7	3.1	3.4	3.6	3.8	4.3
Consumer Price Index									
Index (1967=100)..........	311.1	322.1	330.4	340.6	351.5	363.2	375.8	389.5	404.6
% Chg Annual Rate.........	4.1	3.5	2.4	3	3.3	3.4	3.5	3.7	4.1
Real Gross Ntl Product									
Bil of 82 Dollars.........	3492	3571	3686.5	3816.1	3942.4	4068.7	4189.8	4309.4	4422.6
% Chg Annual Rate.........	4.7	2.3	4	3.3	3.3	3.1	3.1	2.6	2.6
Pers Consumption Exp.......									
Bil of 1982 Dollars.......	2239.8	2313	2372.8	2426.9	2485.2	2549.1	2622.9	2706.6	2793.5
% Chg Annual Rate.........	3.4	3	2.6	2.4	2.3	2.6	3.1	3.2	3.3
Gross Pvt Dom Invest									
Bil of 1982 Dollars.......	661.3	648.6	710.4	756.5	800.5	842.9	874.4	897.5	909.5
% Chg Annual Rate.........	14.6	-0.9	12.1	5.2	5.7	5	3.7	1.7	1.3
Pvt Nonfarm Employment									
Millions..................	81.8	84.3	87.2	89.5	91.7	93.9	96	98	100
% Chg Annual Rate.........	4.5	2.8	3.4	2.4	2.4	2.4	2.2	2	2
Civ Unemployment Rate (%)..	7.5	7.2	6.4	6	5.9	5.4	5.2	5	4.5
Pvt Nonfarm Hourly Comp									
Dollars/hour..............	12.2	12.7	13.1	13.6	14.3	14.9	15.6	16.4	17.2
% Chg Annual Rate.........	3.8	3.8	3.7	3.9	4.6	4.6	4.8	5	5.1
Corp Profits After Tax.....	144	139.9	140.7	135.4	138.5	146.6	156.2	166.5	181.2
Personal Saving Rate.(%)...	6.5	4.6	4.6	5.3	5.4	5.7	5.9	5.8	5.4
M1 (% Chg Annual Rate).....	5.8	12	6.7	6	5.7	5.3	5.2	5.2	5.3
Treasury Bill Rate (%).....	9.5	7.5	6.8	6.3	5.8	5.7	5.7	5.8	6
AAA Corp Bond Rate (%).....	12.7	11.4	9.4	8.8	8.1	7.7	7.5	7.5	7.7
Real Corp Bond Rate (%)....	5.2	4.6	4	4.5	4.6	4.4	4.2	4.3	4.2

* Levels are for annual averages

Source: Laurence H. Meyer & Assoc

TABLE 3: JEC ALTERNATIVE #2 ($10/BARREL)

	1984	1985	1986	1987	1988	1989	1990	1991	1992
Price/Barrel of Oil ($)....	29	28.1	10	10	10	10	10	10	10
IPD, Gross Ntl Product									
Index (1982=100)..........	108.1	111.7	114.3	117	120.5	124.6	129.3	134.4	140.1
% Chg Annual Rate.........	4.1	3.1	1.9	2.6	3.2	3.6	3.8	4.1	4.5
Consumer Price Index									
Index (1967=100)..........	311.1	322.1	328.9	338.4	349.2	361.3	374.6	389.1	404.8
% Chg Annual Rate.........	4.1	3.5	1.8	2.9	3.3	3.6	3.7	3.9	4.2
Real Gross Ntl Product									
Bil. of 82 Dollars.........	3492	3571	3698.7	3842.2	3975.2	4101.4	4215.4	4323	4422.6
% Chg Annual Rate.........	4.7	2.3	4.5	3.5	3.3	3	2.8	2.3	2.3
Pers Consumption Exp.......									
Bil of 1982 Dollars......	2239.8	2313	2380.9	2442.8	2506.2	2573.6	2649.2	2732.8	2817.8
% Chg Annual Rate.........	3.4	3	3.1	2.7	2.5	2.7	3.1	3.1	3.2
Gross Pvt Dom Invest									
Bil of 1982 Dollars......	661.3	648.6	715.3	770	817.9	860.2	886.8	901.4	903.8
% Chg Annual Rate.........	14.6	-0.9	13.5	6	5.9	4.6	2.9	0.6	0.2
Pvt Nonfarm Employment									
Millions..................	81.8	84.3	87.3	89.9	92.3	94.7	96.9	98.8	100.6
% Chg Annual Rate.........	4.5	2.8	3.7	2.7	2.7	2.5	2.2	1.8	1.8
Civ Unemployment Rate (%)..	7.5	7.2	6.2	5.8	5.5	4.9	4.7	4.6	4.2
Pvt Nonfarm Hourly Comp									
Dollars/hour..............	12.2	12.7	13.1	13.6	14.2	14.9	15.6	16.4	17.3
% Chg Annual Rate.........	3.8	3.8	3.5	3.7	4.6	4.8	5.1	5.4	5.4
Corp Profits After Tax.....	144	139.9	142.8	144	144.5	151.1	156.6	161	169.8
Personal Saving Rate.(%)...	6.5	4.6	4.7	5.3	5.4	5.7	5.8	5.7	5.3
M1 (% Chg Annual Rate).....	5.8	12	6.7	6	5.7	5.3	5.2	5.2	5.3
Treasury Bill Rate (%).....	9.5	7.5	6.7	6.2	5.7	5.7	5.8	5.9	6.2
AAA Corp Bond Rate (%).....	12.7	11.4	9.4	8.7	8	7.7	7.5	7.6	7.9
Real Corp Bond Rate (%)....	5.2	4.6	4	4.5	4.5	4.3	4.2	4.4	4.4

* Levels are for annual averages

Source: Laurence H. Meyer & Assoc

Representative LUNGREN. I understand that Congressman Scheuer has another meeting to go to, so I will call on him to ask any questions he would like to ask.

Representative SCHEUER. Thank you, Mr. Chairman.

I have truly enjoyed this hearing as I have enjoyed few before, mostly because we have been hearing almost entirely good news. I feel like the character in "Of Mice and Men," the mental retardate who kept saying "Lenny, tell me how it's going to be." He wanted to hear the good news in the future. He couldn't go for the present, but he wanted to hear the good news in the future. So you have told us how it is going to be.

I suppose there is one lesson we should learn, and correct me if I am wrong, and that is that governments around the world could do very little to stop the extraordinary increase in energy prices after the beginning of the Arab oil boycott and that this reduction that has come in the last year has had very little to do with government intervention. The increase was despite our best efforts and the decrease caught us napping and it just happened. I suppose that means that a lot of the talk about the supremacy of market forces and letting them work their will has just proven its validity in the last year. This is really why we hold these hearings, to educate ourselves and the American public and help prepare ourselves to cope and get your advice on what we ought to be doing.

Is this a time when we should be just thanking our lucky stars that market forces are working and sit back and relax and ask for another can of cold beer? Or are there some things we should do? Are there any little things we can do at the margin? Should we fill up the strategic petroleum reserve? Is this the time to get our house in order against any conceivable sharp increase in oil or concerted action by the oil-producing countries some years hence? What should we do to maximize the benefits to our economy both here and abroad and to lengthen the duration of those benefits and turn what was sort of an act of God into a permanent, enduring benefit in stabilization of the American economy?

I would ask any of you to answer that. It is a broad question. It may be that we just ought to enjoy it and that government really doesn't have any role. If we do have a role, maybe it is central. Maybe it is at the margin. Whichever it is, tell us what we ought to be thinking about doing.

Mr. KALT. Let me first comment on your statement that these events have been the result of market forces. I think in large part that is true. In large part the events that we have seen have been the result of the major consuming nations agreeing in the mid-1970's to allow prices of energy to reflect the rise that was going on in the world crude oil market. That certainly contributed to more efficient energy use, a dampening of demand, which is now one of the sources of declining prices.

Second, as I noted in my statement, decontrol of prices in the United States appears to have added significantly to both the supply and the supply responsiveness of domestic output, and that certainly limits the ability of any oil-exporting country that would like to take control of the world market. That country is limited by the increased ability of the United States to respond to changes in prices through changes in domestic output.

With respect to your question of what should we do now, I think it is important to realize that while we are in a period of low prices right now, that things do look rosy, and it is certainly a welcome change from the last 10 or 15 years, the prospect of disruptions in Middle East oil supply remain very real.

When you look at projections on where the world will get its liquid fuels out into the future, it is likely to be the case that world oil supply will become more rather than less concentrated in the Middle East over the next several decades.

Representative SCHEUER. I have heard that there have been enormous new oil finds in Mexico, offshore Venezuela, offshore Argentina, offshore Canada, offshore China, even in Iraq. Of course, Iraq is the Middle East. But there have been enormous finds of new oil ~~fields~~ in this hemisphere where we don't have to be exposed to shipping across oceans. Most of these could be transferred by pipeline. Only in Argentina would you want to ship it, and even conceivably that could be done by pipeline.

It is true that there are enormous oil fields that have been discovered, large, large inventories?

Mr. VERLEGER. I would like to modify what people said just a little. While we are all talking about the good news, you mentioned Iraq. One of the things that appears in the Washington Post occasionally is the fact the Iranians have crossed the Shatt-al-Arab. The whole situation can turn around literally overnight.

Representative SCHEUER. Nobody has counted Iraq as a stable source of oil supply, obviously.

Mr. VERLEGER. There have been large finds in Kuwait. The Kuwaitis were looking for natural gas and unfortunately found just a whole oil field of very sweet crude oil. They are importing their gas from Iraq and they are importing their water from somebody else.

There have been finds in Venezuela and there have been some finds off Mexico. My understanding is both kinds of crudes are fairly heavy, fairly unattractive, and will be expensive to develop.

Offshore oil is not cheap. Development of offshore oil in California costs $15 to $20 a barrel as Congressman Lungren knows. The North Sea producers' marginal costs are $4 to $5, maybe $3 a barrel, but you don't put a platform in unless you are looking at recovering $20.

I think we ought to back up, by the way, on market forces. I am a strong proponent of market forces, but this is not an act of God that prices have come down. It is not even an act of Allah; it is an act of a government, Saudi Arabia, that decided it did not want to import oil in 1987, which is what it really was faced with doing as the swing producer if it were going to stabilize the market.

Also, to say we got to the situation just by market forces ignores the fact that Brazil decided to cut down the Amazon forest and go to ethanol and decided as a state policy to invest in oil where the full costs are probably $45 a barrel offshore and will continue to do so because of the shadow price of foreign exchange.

It also ignores the fact that the Indians, faced with very high prices of oil in 1973 and 1974, decided they had to produce domestic oil from the Bombay High, decided they wanted it to be produced by Indian oil companies initially, not by the multinational oil companies, so they would be sure to get the production and would not get squeezed, and they have been willing to pay a substantial premium.

This gets back to what the United States should do as a policy point of view. The first action is definitely to fill the strategic petroleum reserve. Now is the time to fill the strategic petroleum reserve. We teach students in economics to buy low and sell high. The U.S. Government did it once in its management of strategic inventories. You instructed the Secretary of Energy to test the SPR. He sold around the end of November, which marks the high point of prices for the last 3 years. But we should be buying oil for it now.

And we probably should look seriously at the loss in domestic reserves, because some of the reserves that will be lost now, the tertiary recovery oil in California, the secondary recovery and tertiary oil in Texas, is going to be lost for good. Low oil prices are going to bring about the end of the infrastructure, the drilling infrastructure, and the next time prices go up investors will be much more cold and calculating as to whether they are going to go and build the drilling rigs and build the other material to do it.

How one does that is an open question. One suggestion has been made to impose an oil import fee. Four dollars a barrel, according to my rough estimate, would cost the consumer $21 billion.

Representative **Scheuer**. How much would it produce for the Government?

Mr. **Verleger**. I didn't do the numbers, but substantially less than that. Probably around $7 billion. Refiners would capture most of the rest.

A second proposal that would cost much less is to buy domestic oil for the strategic petroleum reserve rather than buying imported oil for the strategic petroleum reserve and, to take a leaf out of the agricultural programs, say pay $4 or $5 a barrel over the price for incremental oil which would otherwise be shut down. That would cost the Government something like $580 million for the same $4 price increase. So you are talking about a 40-to-1 ratio.

It does have a problem in that it is going to create all sorts of regulatory nightmares. Joe Kalt and I have both written extensively in academic journals about the problems of price regulations. But I think the problem of price regulations can be summarized in one name: Mark Rich.

Representative **Scheuer**. Excuse me. I didn't get that.

Mr. **Verleger**. Mark Rich, the oil trader who ran circles around our price regulations. A price support program always raises some regulatory nightmares.

If you are talking about a solution, I think it is valid, one, to maintain some productive capacity for a disruption in the future, and two, it has to be done in the most efficient fashion. This one idea is the most intriguing idea I've heard. It keeps production around and it adds to the SPR. So you get two for one.

Representative **Scheuer**. This is a fantastic panel. I am sorry, but I have an 11 o'clock appointment. I must go. It was an absolutely marvelous panel. I thank all four of you.

Representative **Lungren**. Thank you.

I would like to ask a question. Following up on your suggestion that part of the infrastructure for drilling is going to be lost forever for tertiary and secondary recovery, one of the questions I would like to pose to the panel is—and any of you who would like to answer, I would be pleased to hear from you—during the period of time that we had controls on there was the argument that we had less exploration and less drilling than we would have had otherwise. We had decontrol and coincident with that we saw a rise in wildcatters. Whatever you think the reason that you saw the increase in wildcatter activity, exploration and then production, it appeared to me that we were able to respond rather quickly from rather slow periods of time during certain parts of the 1970's and accelerate very, very quickly.

Is what you are suggesting, Mr. Verleger, that conditions are so different now, particularly from the investment side, that is, that investors would be far more cautious to put their money into drilling, that we would not be able to easily get out of that situation next time around?

Mr. VERLEGER. Yes, sir. I have taken a table in the report I write monthly for Charles River Associates from a publication by Salomon Bros., and one finds that between 1979 and 1981 expenditures on drilling increased from $16.5 to $38 billion. That is not in my testimony. I will be happy to provide the table to you later.

What happened was that the price decontrol created a huge cash flow to the industry and the prospect to higher prices for some time to come, and so it was reinvested.

Economists have struggled for 20 or 30 years to model the behavior of oil field service people and the whole exploration process, but in some ways it is very difficult to model the behavior of an independent oil man. If he sees the prospect of higher prices, his answer is get money and drill wells.

During the 1981 and 1983 time period we built many rigs. Most of these rig companies that built the rigs are now bankrupt and most of the people that bought the rigs are bankrupt. It's very much like the farm crop cycle where the farm implement dealers do very well with high prices and the manufacturers of farm implements do well. Low prices are one of the processes of putting these people out of business, causing reallocation of investments by large corporations, and they are going to leave us without the capacity.

Representative LUNGREN. Mr. Kalt, could I ask for your response? What I get from your testimony is that you might have a little different view.

Mr. KALT. That's correct. I have recently been involved in some research on the response of domestic drilling activity to changes in prices. This research indicates that the response to changes in prices when prices are expected to be permanent, that is, when you are thinking about making an investment, is when you think prices will stick around at a high level for a while. In those cases the statistical analysis of the aggregate drilling activity of the domestic industry indicates that over 90 percent of the drilling response to a permanent increase in oil prices occurs within about the first year of the price changes. That is, in the aggregate our drilling activity responds quite rapidly to changes in prices.

Certain categories of activity, such as expensive tertiary recovery projects, indeed are much slower. When we are worried about insulating the economy from a change in world oil price, then we are worried about the total oil output of the Nation, not the output from tertiary recovery projects. In the aggregate the response appears to be quite rapid.

Representative **Lungren**. On secondary and tertiary recover, we have had some fields closed in before and gone back. They are identifiable resources. We have the technology; we know how to do it. I guess it is really a function of whether we have the capital to utilize there. I am interested in why you say they are lost permanently.

Mr. **Verleger**. Take the Wilmington field in California.

Representative **Lungren**. I would like to take it.

Mr. **Verleger**. There are parts of it where it is under water recovery right now and the water cut ratio is about 98 percent; that is, it is 98 percent water and 2 percent oil. Under the Resource Recovery Act regulations, that water has to be reinjected fairly carefully to avoid damaging the aquifers in southern California, for very, very good reasons. It is a permitting process in doing the whole thing. The lifting costs, I understand, can run as high as $15 on some of the older parts because of the cost of electricity.

What will happen is as those fields get shut in the permits will be allowed to lapse. The remaining oil in place will be fairly difficult and expensive and long term to be brought out.

Joe Kalt is right. If a permanent price increase were expected the industry would probably do something about it. But I think the Saudi Arabians and the OPEC countries have demonstrated successfully to the companies that make these investments and make the investments in offshore oil, which is where you expect to find the large reserve responses, and not in 1 year but in 5 to 10 years, that they are perfectly willing to create a volatile price environment.

I have been lecturing for the last 2 years that oil has become a commodity. The industry is gradually coming around to the conclusion. What it does in response is cut $1 billion out of a company's exploration budgets. ARCO has delayed substantially its exploration budget in Alaska. SOHIO has done the same. The increased uncertainty that the prices are going to come down 5 years from now, then increase 7 years and then decline again is going to reduce for many years to come the industry's willingness to go out and make investments.

I think the innocence of the industry has been wiped out today just as it was in the 1930's by John D. Rockefeller.

Representative **Lungren**. It is refreshing to hear someone talk about the innocence of the oil industry. We don't hear that often in the halls of Washington.

Mr. **Kalt**. I believe that Phil Verleger is right that the risk that the Nation faces is not so much that we will go back to a world of high prices but that we will be living in a world of very volatile prices, that is, that we will occasionally be shocked as we were in 1973 and in 1979, and we may be again shocked. If that is the problem that we face, then it seems to me a far more reasonable investment of the national resources would be to build the strategic petroleum reserve than to risk sunk capital in the Long Beach Harbor which has very low supply response when all is said and done. If you want to respond quickly, then you fill the strategic petroleum reserve.

Representative LUNGREN. Is that because the strategic petroluem reserve, in essence, is seen by other countries who might get involved in political decisions to try and influence our markets as an almost immediate response mechanism that can react politically as they are acting politically?

Mr. KALT. The strategic petroleum reserve has yet to be tested.

Representative LUNGREN. Are you talking about before it gets out of the ground?

Mr. KALT. Some of us are worried about how quickly we can get the oil out. In principle, if the oil can be brought out quickly, it provides two things:

The ability to quickly respond with some domestic supplies in the face of some hostile interdiction in the Middle East. That ability is a deterrence to that disruption in the Middle East.

Second, if a disruption occurs, prices rise very rapidly, and the ability to quickly respond with domestic supplies can put downward pressure on the price and insulate the country from the price effects of a disruption.

Representative LUNGREN. Rather than an act of God, as was suggested, it may be an act of Saudi Arabia that has brought us rapidly to where we are now with falling oil prices. Mr. Kalt, you have given us some ideas of why the Saudis did it, as did you, Mr. Verleger. I guess everybody agrees the Saudis did it for particular reasons.

Would it be too much of a flight of fancy to say that perhaps they intend not only to try to maximize the return to them in the short run but get themselves into a position where they have driven out enough other producers in the world, particularly high-cost producers in the United States, so that they can set the price at some future date?

Mr. KALT. I think that is possible. Indeed, the Saudi Arabians have so much as said that occasionally over the last decade. At the current time my reading of the Saudi situation, however, is not that they are on some drive to drive down prices now so they can raise prices later, but that in fact they got very fearful of their revenue shortfalls and were in the position of having to, as Phil Verleger puts it, perhaps start importing oil in 1987. My view is that Saudi Arabia did not want to go out and borrow. They had very high revenue needs, they weren't getting enough oil revenue, and they thought that by increasing their output they could increase the oil revenues and finance the deficit.

Mr. VERLEGER. Let me respond, because I think Joe Kalt has given a nice academic response. My discussions are that the Saudis are doing exactly what John D. Rockefeller did, which was sweat the market out. It is a classic play in monopoly power. They were well aware of what they would do. It was well calculated.

And they had been well educated. I had them when I was teaching at Yale. Joe Kalt has them at Harvard. They understand exactly what they are doing, where they are coming from.

Former Ambassador Aikins, in Canada, in November, gave a speech saying, look, they have nothing to lose if the banks fail. If the banks don't fail and the economy grows, they will have a much larger market share and they will be the dominant firm and they will be able to essentially set the price and bring the price back up the way they want to do it.

It is, pure and simple, a lesson out of a microeconomic text. They know what they are doing.

Representative **Lungren**. Are they engaged in predatory pricing?

Mr. **Verleger**. The trouble with making a predatory pricing argument is that their costs are so low. Their cost of production is 50 cents a barrel, so the predatory pricing argument, were they a domestic firm, would be very hard to make.

Representative **Lungren**. A number of you have commented on how this affects different countries, how some of the countries that rely so much on oil production, particularly rising prices, or at least stable prices at high levels, will be adversely affected. Yet I haven't heard anybody here talk about what I understand is the largest producer in the world, the Soviet Union.

Are any of you aware of any analysis done as to the impact on the Soviet Union?

It is my understanding that they use their energy exports to generate what I guess everyone would agree is much needed foreign currency.

How serious is the effect of the oil price drops on the Soviet Union's ability to earn foreign exchange for much needed Western technology or consumer goods from the West?

Does anybody have a thought on that?

Mr. **Kalt**. My understanding is that the Soviets currently get something like 70 percent of their foreign exchange earnings from the sale of oil. The falling oil price is going to cut into those earnings unless the Soviets respond by increasing their output and trying to sell more and raise their exchange earnings in that way.

My reading of the Soviet Union is they indeed are an extremely large oil producer, but they, like Mexico and a number of other countries, appear to lack the ability to play the role of the swing producer. They lack the ability, I believe for managerial and planning reasons, to really play the role of the swing producer. There is certainly a danger that the Soviet Union, were they to have flexible supply, could indeed play the role of a Saudi Arabia. Thus far they have been unable to do that.

I suspect that they will not act as a swing producer now, and that means that their foreign exchange earnings will fall. The implications of that are far beyond my expertise.

Mr. **Verleger**. I just received yesterday IEA's monthly oil market review. They put Soviet exports, or CPE net exports, at 2 million barrels a day for the first 11 months of 1985, which would be on an annual basis 730 million barrels. That means that the Soviet Union has probably lost export earnings on the order of $10 billion. They will gain something from our U.S. agricultural policy since they are usually a food importer and since our new farm policy is going to bring about lower food prices.

So there is some net offset. But given the pressures that Chairman Gorbachev has shown for pushing the Soviet Union into modernization of the economy, I would expect that we will see the Soviet Union for the first time probably knocking at the doors of Western banks, looking to borrow money. I have been at two or three sessions where people have talked about the Soviet economy in general, and I think that is one of the things that the lower oil prices will do. Chase will find it has a new potential customer.

Representative LUNGREN. So the Soviets will be knocking at Chase Manhattan, and Saudi Arabia, if it doesn't change its policy, will become a net importer of oil. It gets stranger and stranger as we go along.

Mr. Friedman, you suggest that the oil price decline would significantly reduce the budget deficit over the next 3 years. Did you say how much?

Mr. FRIEDMAN. In the $20 to $30 billion range with progressively more in the way of improvement as we get to 1988.

Representative LUNGREN. Mr. Prakken, do you agree with that?

Mr. PRAKKEN. Not entirely. Can I briefly outline for you the forces following a decline in oil prices that would tend to raise the deficit and those that would tend to lower it?

Representative LUNGREN. Sure.

Mr. PRAKKEN. With lower oil prices real economic growth initially rises. Real incomes go up, and that would tend to increase tax revenues and reduce the deficit.

On the other hand, once you start getting down to, as Phil Verleger says, single digits, you are also thinking about losing a fair amount of revenue from the windfall profits oil tax, which is a partial offset.

Lower oil prices, of course, also mean lower nominal incomes, which mean lower tax bases, which would tend to reduce tax revenues.

So the real question here is not whether GNP is rising, but what is happening to nominal GNP. As I have tried to argue, for an unchanged rate of growth in the nominal money stock you could expect maybe not such large increases in the nominal GNP over this period.

The effect in interest payments by the Federal Government depends very crucially on your estimate of how much lower interest rates would be with lower oil prices. My conclusions are that this will not permanently reduce the inflation rate, so I would not expect a permanent reduction in nominal interest rates. Our estimates are that in the first 2 years the deficit would be smaller to the tune of about $13 to $15 billion.

Representative LUNGREN. Per year or total?

Mr. PRAKKEN. Per year. So cumulatively somewhat more than that. Perhaps as much as $20 billion.

I would point out that the typical average error in forecasting a deficit this far ahead is probably considerably larger than $20 billion. So it is not at all clear that you can count on this sort of fortuitous event for us to make the task of balancing the budget much easier by 1991 or whatever time horizon you want to pick.

I think there is some relief in sight from this, but it is not, in my judgment, nearly as unambiguous as Mr. Friedman suggested. Some relief, but not a tremendous amount.

Representative LUNDGREN. Mr. Friedman, do you wish to respond?

Mr. FRIEDMAN. Yes. You can divide the improvements into three parts.

The price indexes on Government purchases of goods and services are improved by, let's say, an average of about a percentage point over the next 3 years. If we have a trillion dollar budget, then you get a quick something like $8 to $10 billion there.

If the net impact on interest rates is 50 basis points on a trillion and a half national debt, then you get $7.5 billion there.

On the income side, if the unemployment rate is half a point lower, 700,000 or 800,000 people, and some sort of average income of $20,000 every year per person, when we worked it out I think you get something like about $7 to $10 billion there.

So it breaks down pretty much equally into the three pieces where your deficit improvement is.

Mr. **Prakken**. Can I ask Mr. Friedman his estimates of the revenue loss from the windfall profits tax evaporating and also the revenue loss from the effect of lower price level, lowering the nominal tax base? You had a fairly substantial decline in the price level over 3 years which, other things equal, would tend to reduce tax receipts.

Representative **Lungren**. If I am not mistaken, I am informed by my staff that the windfall profits tax annually is about $3 billion.

Mr. **Prakken**. That would be the number that I would use.

Mr. **Verleger**. It essentially ceased to be relevant a year ago. The base price for tier one oil, which is the only thing that is really generating any revenue, was up around $20 a barrel by last January. Even $18 or $19 a barrel essentially eliminates that as a source of revenue.

Mr. **Friedman**. The answer to that part is a loss of about $3 billion.

On the other question, tax base, we don't feel that the path of wages is likely to be all that much lower as a result of this. It is a function in part of where we stand in the business cycle. Unemployment rates are already relatively low compared to what they have been over the last 5 years. So the reduction in inflation, in our view, doesn't reduce the growth rates of wages particularly, not significantly, and therefore that decline in personal income theoretically does not show up empirically.

Representative **Lungren**. Mr. Prakken, in your testimony I believe you were talking about some positive effect on GNP growth, at least for the short run.

Mr. **Prakken**. Yes.

Representative **Lungren**. I think you said a $5 decline in the price of oil would raise real GNP growth by a half a percentage point in the first year, and three-tenths of a point in the second. We have had an oil price drop of about $10 in 6 months. If the prices were to settle in the low teens, does it suggest, by your analysis, that we might have a GNP growth of 1½ percentage points higher in the first year?

Mr. **Prakken**. Using the sort of handy-dandy rule of thumb, yes, that is the case.

I guess my warning about that would be as follows:

In my particular analysis, when I talk about a reduction in the price of oil I do not mean a reduction in the spot price; I mean the reduction in the average price of imported petroleum, the amount that we are actually paying as we bring it in.

That nicety aside and assuming that the decline is real, that is, it doesn't drop down and then start coming back up, let's say we have gone from something under $28 a barrel to something under $20, that would certainly add a full percentage point to economic growth over the first year following that decline. I think that is a pretty good assessment.

If you look at the forecasts made in the private forecasting industry, of which we are a part, you will see very sharp upward revisions in most people's forecasts for 1986 principally attributable to the decline in oil prices that has occurred in the last 6 to 8 months.

Representative **Lungren**. Mr. Prakken, on the basis of your simulation, how powerful an impact do falling oil prices have on employment and unemployment.

Mr. **Prakken**. I can read you the figures here. Our estimate was that over a 7-year period not very much. Because, as I argued before, for an unchanged monetary policy most of these effects would be transitory, but after 2 years we have employment up by 700,000, which is a little bit more than Mr. Friedman's estimates, and given the current size of the labor force, that is a reduction in the unemployment rate of six- or seven-tenths of a point, which is very substantial.

Representative **Lungren**. What we usually talk about up here on the Hill with respect to CBO analysis and so forth is a general rule of thumb that 1 percentage point change in the unemployment rate translates into about $20 billion with respect to the overall deficit situation. That accounts for less funds going out and also increased tax revenues. So at least in the short run I guess we have agreement from you that in the first couple of years it would have a positive effect both employment-wise and therefore on the economy.

Mr. **Prakken**. I think, given Mr. Friedman's comments, that our source of disagreement has to do with the path of wages in the first 3 years following the oil price decline. Our analysis suggests that as prices fall, labor will demand less in terms of wage increases and wage growth will be reduced somewhat. Not real wage growth, not wages relative to the cost of buying goods and services, but nominal wage growth on which taxes are based will actually be lower for 2 to 3 years and hence some tax revenue loss.

I think that is where we are going to differ on the revenue estimates.

Mr. **Verleger**. It occurs to me as I listen to this that in our analysis of the U.S. economic situation too little attention has been focused on the effect on the rest of the world. I have a hard time believing that if prices were to go down and stay down, that 7 years from now we would not say it had a very major effect on the United States.

I think where I would differ is that the lower oil price will stimulate growth in the LDC's. If one looks at the growth rates that were experienced in the 1960's, they were around 6 percent, and then there is a sharp decline. After 1973 and through the first 4 years of the 1980's we have seen 1.5 to 2 percent as these countries have struggled with their mountains of debt taken on during periods of high inflation.

The decline in the price of oil has the greatest stimulus in these countries. The feedback effects, particularly combined with the effect of the weaker dollar, which is the other international effect which has just kind of gone unsaid, will have to have a stimulative effect and help the United States.

I guess one of the questions I wonder, and I think it's an unknowable, is what this will do to our balance of trade, our exports to the third world countries, and the exchange rates.

Representative LUNGREN. Earlier in the testimony there was the suggestion by you, Mr. Verleger, that Mexico has been persistent in its reluctance to change its marketing tactics. You mentioned that Saudi Arabia was able to really recoup because it went to the netback contracts and that Mexico has been unable to do that.

First of all, do you think it is a truism that Mexico will be permanently unable to do that?

Second, if Mexico were able to move in that direction, what would be the impact on Mexico in terms of its ability to sell its oil and to raise revenues from it?

Mr. VERLEGER. As I said in my testimony, Mexico has lost three ways: Because oil prices have declined, and because they were first they were forced to take a much greater cut in their price than the Saudis. They will never be able to offset this second effect. The third effect is that they have lost volume.

What happened last year is that Saudi Arabia found its oil was selling at a persistent discount to other crude oils because it was further from the market. In the technical parlance of the oil trade, it was long-haul crude.

Everybody thought the price of oil was going to come down; there was fear that the price was going to come down, so that refiners throughout the world operated on a just-in-time system. They would buy the crude at short as haul as possible. Mexico enjoyed a premium and the North Sea producers enjoyed a premium. The Saudis have found a very clever way of selling their oil in a fashion which overcomes that problem. They give the buyer 40 days after he lifts the crude before the price is set. So that gives a buyer buying crude from Yãnbu if he sails the ships fast, which is what they are doing, time to get the oil to his U.S. refinery in 30 days, refine it and have it on the street by the time the cost of the crude is set. So the Saudi Arabians overcame that distance disadvantage, and the Mexicans can do nothing about it.

Representative LUNGREN. The way it works, the cost of crude is set as a reflection of what the refined product is selling for?

Mr. VERLEGER. Yes. There is a view that this is new. I have written over the last 5 or 6 years a number of articles showing that in fact official crude prices had always just followed these product values but with a long lag. What the Saudi did is took a 9- to 12-month adjustment lag in an econometric sense and collapsed it down to minus 5 days.

Representative LUNGREN. So what you are saying is the problem that confronted the Saudis in terms of the long-term haul nature is overcome by this marketing mechanism but that same problem is not what lies at the root of Mexico's problem.

Mr. VERLEGER. The Mexicans could overcome part of their problem. The Saudis crudes have gone from costing probably $26 to $16. The North Sea crudes, which I follow more closely, have gone from $30 to $12. So it is a $10 versus an $18 swing at this point. The Mexicans could overcome half that by pricing their oil as favorably, but they will never be able to recover the other half of the advantage they used to have.

The trouble the Mexicans seem to have with net-back pricing is that Pemex has always been very uncomfortable about accusations of corruption, so they want to have a public price that they set. Through January and into February they told buyers "we will tell you at the end of the month what the crude oil costs."

Well, most buyers want to have an arbitrary arm's-length way of setting pricing. Indeed, the oil industry has been most backward of all the commodity businesses in the way it fixes contracts. The Saudis have moved it into the 20th century. The companies have just told Mexico, look, you have to have a contract that is tied to product prices that we can look at and we can pick out an independent arbitrator that has no financial interest in either side that can say what the oil is worth. The Mexicans have some political and institutional problems in adopting a contract like that.

Representative LUNGREN. Until they do they are going to continue to have even more difficulties than they would otherwise have on the market.

Mr. VERLEGER. That is right. The thing is that they have become the swing producer, and if they really try, as they said at the end of last week, to increase exports to 1½ million barrels a day from 1 million barrels a day, they will have to force somebody else to shut down. It is beginning to look like one of the areas this will have to cut back is Alaska. The price will get down to the point where it may almost be unprofitable to move Alaskan oil to the gulf coast. Which is another interesting phenomenon: Does the United States become a swing producer?

Representative LUNGREN. Mr. Kalt, I remember 6 or 7 years ago up on the Hill the arguments we had about whether we should decontrol domestic oil, and then, after that was set in motion, whether we could dare accelerate that. I recall some predictions of $90 per barrel of oil, some suggestions we were going to have $2 to $2.50 to $3 a gallon gasoline at the pump, and even though I had been convinced by economists that that was not the case, I must tell you it was difficult to sell that to the people at times.

When we did have the acceleration of decontrol a lot of us were holding our breaths to make sure that it worked the way that we thought it was going to work. I happen to think it worked.

I think you have mentioned that it is one of the elements that was used in bringing prices down. Does it suggest to you that it has worked farily well, and is that an indication that at this particular time, as oil prices are dropping and as in some cases oil now becomes very competitive with natural gas for those who can use either one, it would be propitious for the Congress to accelerate natural gas decontrol?

Mr. KALT. In answer to your first question, I think it is quite clear that oil decontrol aided in the decline of world oil prices and domestic oil prices. To the economist, while it sounds like an act of faith, that wasn't particularly surprising. Price controls at the wellhead discouraged supply. Less supply meant higher prices at the pump, not lower prices. What you really did with decontrol in the United States is you slowed down the decline rates of domestic oil fields, and the impact of that additional supply relative to what it would have been was to make more products available and put downward pressure of the price of products relative to what it would have been.

With respect to your question about natural gas, indeed many prices of natural gas that are now in the high-cost contracts are not competitive with oil. Oil has fallen way below natural gas contract prices.

I think it is quite clear that with the current oil price situation that the rapid decontrol of natural gas, which is the old gas that is still controlled, would eliminate any remaining so-called cushion between market prices and ceiling prices of gas. This would hasten the renegotiation of high-cost gas contracts. The net impact would probably be a fairly significant reduction ~~in the consumers'~~ price of natural gas. What you would do if you decontrol is you would really essentially cause the renegotiation of the high-cost gas contracts and the consequence of that, as I say, would be to lower the consumers' price of natural gas.

Representative LUNGREN. Do any members of the panel want to comment on that?

Mr. VERLEGER. Joe Kalt was right on oil prices when you talked about controls years ago, and he is obviously right on gas prices.

Representative LUNGREN. It is one thing to be able to talk about an economic theory and to believe it and to believe it is the right thing to do. It is another thing for Congress to get the political will to do it. Sometimes we need something like the shock of dropping oil prices to dismiss the argument that a deregulated natural gas market would push up prices. There is not that fear there. It just seems to me that with the situation that now exists it would be the appropriate time for Congress to act in that regard.

On the question that was posed earlier about what we ought to do, several of you mentoned that we should fill the strategic petroleum reserve as much as we possibly can, filling it with that cheap oil that is out there now. There was a suggestion that we might do it by buying domestic at a premium, and keeping some of the tertiary and secondary recovery.

But then you do get into the whole bureaucratic nightmare. Although it is a very attractive proposition, my recollection of what happened when we had the control of oil and the entitlement program is that we had wells that were shut down in southern California, in my own home area, Long Beach, owned by the State of California, because it would cost them money to bring it out. The strange thing was that the heavy crude that we were producing—which was not as valuable to the refineries because it took them more processes to get the refined product—ended up after you figured out that the entitlement program to be more expensive than if they brought in Indonesia sweet, because we were trying to be fair to everybody.

I have nothing against Congress trying to be fair, but usually we try to be fair on historical data, and historical data is historical by definition, which means it does not reflect the market at the time you see it.

Do you have any more faith that we can overcome that in solving this particular problem?

Mr. **Verleger**. I should say that Joe Kalt wrote probably the best study of the effects of price controls. I wrote a book on the effects and showed the same things that he has talked about.

One of the things that happened is the 1-Year Price Control Program put in in 1971 was extended for 12 years, and you had, with entitlements, Long Beach crude selling for $3 because of the cost of the entitlement program. So fix upon fix was put on, and finally California crudes got special entitlements. It is all absurd. That shouldn't be done.

I merely suggest that if we are going to do something to maintain domestic production that an oil import fee has all the problems of the entitlements program before, and it cost the consumers $20 billion for $4.

A much easier solution is to buy oil for the strategic petroleum reserve, and rather than buying Mexican crude oil, buy domestic crude oil, and to bid to certain producers to give them checks. It does not affect the market. It is just the way some farmers get crop price supports.

Set a price support level for certain types of wells. It is an idea that has been circulated some around Washington, and I think it makes some sense, because it does two things. One, it keeps wells in production so domestic supply is higher and come the next interruption or crisis we have a higher level of domestic production that we step off from.

Second, it essentially applies what is called the import premium, which Professor Kalt and his colleagues have written about for a number of years, saying that in fact the price of imported oil does not include the security premium or the risk of a disruption. So it is really paying the security premium to the domestic production. At the same time the oil goes into the strategic petroleum reserve, so we have a larger reserve to call on come a disruption.

As I said, the ratio works out to be something like 40 to 1, $500 million versus $20 billion. It does not affect any other production; it does not affect refiners; it has none of the problems of entitlements; but it still would be a bureaucratic nightmare, and for that reason more than anything else I don't like the idea.

Representative **Lungren**. I guess one of the most intriguing things that you mentioned is that this would be coming from wells that essentially would be shut down under market conditions, and so you are not affecting the supply that otherwise exists in the marketplace.

Mr. **Verleger**. That is right. In a sense, we expect prices to be volatile. If Congress decides that the risk of substantial price fluctuations create a problem, then action should be taken. One action which might be taken is to add oil to the SPR. Almost all economists agree we should add oil to the strategic petroleum reserve, this has all the benefits of those without sticking the consumer with a very large increase in price, which would have a number of deleterious effects.

Representative **Lungren**. Do you think it would be a good idea for us to run a test to make sure we can get it out after we got it in?

Mr. **Verleger**. My impression is we did in December, didn't we? The U.S. Department of Energy sold oil from the strategic petroleum reserve. It announced its auction procedures and published the bids. It got $30 a barrel for some of the oil.

Representative **Lungren**. It sold at the right time.

Mr. **Verleger**. It sold at the right time. They ran the test, and my understanding is that they actually delivered the oil. They should have sold more oil and they should have been buying it back now. My impression is that we have now passed through that point, but I may be incorrect.

Representative **Lungren**. One of the big issues before Congress during this period of time is the whole question of trade. Japan always surfaces. It almost sounds like we are forcing consumers at gunpoint to march into Toyota dealerships to buy those cars against their better judgment. I have been in California 39 years. I have not seen that happen yet, and we sell a few cars out there.

I wonder what the implications are for Japan. Japan imports most of its oil, if not all of its oil. It is 90 percent dependent, I guess, on imported oil. Compared with us, they are in a far more vulnerable position.

Will this, as some people would view it, make Japan more of a competitive threat to us because it might improve their international competitive nature? Or, on the other hand, would it have some of the same impacts on Japan as it had on the United States, only more intense, because they are more dependent on oil? This frees up more of their income for consumer type items, which then may have the desired effect in trade policy that some people have been urging in the last couple of years in the Congress.

Mr. **Prakken**. Let's break it into two parts.

First of all, the effects that oil prices have on the domestic economy will have the same kinds of effects on all economies of oil importing nations, Japan being no exception. They will face an improvement in the terms of trade vis-a-vis oil exporting nations, and since they are more dependent on oil exporting nations than we are, their consumers will benefit proportionately more than ours will. On balance, you would expect in the near term that their economy would expand. It is going to help our exports there to the extent that they buy our products.

Whether they get a productive relative advantage compared to us depends on how much their production process is energy based relative to ours. My understanding is that they are probably more energy efficient in production than we are. So their production costs are not going to be lowered as much as ours are for a given drop in the price of oil. So it is not clear to me that they will gain a cost advantage over us, but they will gain a bigger consumer advantage than the United States.

Representative **Lungren**. So for once our relative inefficiency actually assists us. That's a negative way of saying it.

Mr. **Prakken**. Yes.

Mr. **Kalt**. I was going to make the same point. If you look back pre-1973, the United States was one of the worst in terms of energy efficiency, dollar energy input per dollar of output. While we have made progress, we have not caught up with the rest of the world in terms of their energy efficiency, and in some sense that is fortunate for us now. So long as this is a durable price decline we should be happy that we didn't overinvest in conservation, because, as was just suggested, in terms of the relative impacts a decline in oil prices helps the relatively energy inefficient nation, that is, the United States.

Mr. **Verleger**. I think actually Japan is going to also be hurt because they have rapidly moved into nuclear power. About 75 percent of their electricity is now produced by nuclear power versus something like 15 percent or 10 percent back in the early 1970's. In fact, they have managed to construct, if my recollection is correct, six or eight new powerplants that they had planned on since the 1979 prices. We are still finishing the plants that we started after the 1973 crisis. They already have theirs on stream. So in a sense they have reduced their oil imports and they have consequently muted many of the effects lower oil prices will have on their domestic economy.

Representative **Lungren**. Mr. Friedman, on this question of GNP growth, do you think the level of GNP will be higher in the long run, or is this just a short-term aberration as a result of the oil price decline?

Mr. **Friedman**. I think the important thing is that whatever extra GNP we have in the short term counts. If the level in 1990 were identical under either the oil prices we have now or what we would have had if Saudi Arabia had not increased production, still there will have been those cumulative gains over the interim. I think that is the important point.

Representative **Lungren**. I guess the panel has all agreed that Saudi Arabia in their actions is a major factor in this, if not the major actor in this whole thing.

Does that mean they have the ability to turn it off? In other words, can they reverse this?

Are they in the driver's seat such that we might adapt policy to present-day circumstances with Mr. Verleger's suggestion, or, having once helped set it in motion, are they somewhat captive of the existing market forces?

Mr. **Kalt**. I think in the short run, certainly in a technical sense they continue to be able to swing the price. If they wanted to cut their output in half tomorrow, they could drive the price up as rapidly as they have driven it down. The questions, of course, are whether they would do that.

On the lower side they are bounded by zero; that is, I suspect they would not get in the position of importing oil and they will remain a net exporter. So they can't do more than pull about 5 million barrels a day off the world market. That would certainly drive prices up very rapidly indeed.

I think the question is, in the short run, were they to cut back their production attempting to drive the price back up, they would probably find their total revenues declining as a result of that, and they would be in a position of either having to deplete their holdings of foreign assets, cashing them in, essentially, or they would have to go on the world market to borrow. They seem to be reluctant to do either of those things.

In the longer run, I think the danger is quite real that they could have a strategy in which they discourage investors in non-Saudi oil by showing those investors these very volatile prices.

Representative **LUNGREN**. Has the ability of Saudi Arabia to affect the world market so abruptly in this way given us a sign that not only should we continue to fill the strategic petroleum reserve but increase its size as well?

What I am trying to say is, how large a reserve do you think is necessary for us to have in order to protect against the Saudis or somebody else manipulating the market so that we would be in a vulnerable position? Or can you quantify that?

Mr. **KALT**. We are smiling at each other, because it is difficult to answer the question of how large the strategic petroleum reserve should be. As a sort of a back-of-the-envelope calculation, a reasonable calculation to make is to ask yourself what is the reasonable swing in output that we might see from the most likely disruption to supply, whether that be a cutback in Saudi production or some blowup of military matters in the Middle East or whatever. So if the Saudis are in the short run willing to swing 2.5 million barrels a day, then that might be a benchmark from which you start thinking about the size of the strategic petroleum reserve.

What makes it so difficult is that there are a number of possibilities in the world oil market as to where we might get nailed by higher prices again, one of those being some blowup of the Iran-Iraq situation that spreads to other countries in the Middle East. We economists have a difficult time putting probabilities on world military and political affairs.

Representative **LUNGREN**. So do we politicians.

Mr. **VERLEGER**. I was smiling at Joe Kalt because I hate to think of how many hours I have spent reading studies about what the optimal size of the SPR should be. I think you keep coming back to the answer it should be bigger than plans have called for and at least a billion barrels. The billion barrel was marked down as consumption declined after 1981 and as domestic production failed to decline in the way it had been projected in 1980 and 1981.

A larger SPR is clearly important and a growing SPR will become even more important if the Saudis do as I think they probably will do, exercise their capacity to become again the dominant producer in the world market. Particularly, I think it is important given the fact that Saudi Arabia is a country with a fairly low population, a lot of oil and subject to great risk of some form of internal dissentation.

One of the reasons I think they are doing what they are doing right now is that they have three choices. Joe Kalt has indicated two: borrow money or cut back on their assets. The third is cut consumption, and they have tried cutting consumption.

They have a major recession going on there in the kingdom where many Saudis cannot find jobs. You know in California what happens when employment goes up. You hear about it here very quickly. They looked at this and they wanted to have enough revenue coming in to keep their economy going and keep people in work and keep the thousands of the members of the family in their Rolls Royces.

Representative **Lungren**. So there are some very real circumstances which exist that limit their ability to just drive production down to zero or be a net importer.

Let me address this question of conservation to all four members of the panel. I know you have addressed it in various ways in your statements.

Obviously there are those things that we did in response to the 1970's that you are not going to undo. I don't know of anybody, because of lower oil prices, who is going out and ripping the insulation out of their house, or running out and buying Cadillacs because they are bigger. I happen to drive a 1971 Chevy that is a gas hog, but it's only because I can't afford another one yet.

What should we be concerned about in terms of the signal to the U.S. consumer?

During the period of time when President Carter was in office and he was giving his chats about how we should be conserving, it always struck me that despite his forcefulness as a spokesperson, the fact that price controls on petroleum products did not keep people from going to the gas station and getting something fairly inexpensively was a stronger signal to them than whatever the President of the United States or their local Congressman said.

I know it is very difficult to forecast something like this, but how well prepared are we right now in terms of conservation, that it will not be reversed to a significant degree because of the drop in oil prices which are beginning to be reflected at the gas pump? I think everybody has seen that. We were saying for a while, when are we going to see it? We are seeing it and we are seeing it very quickly. Today if you see two gas stations, one on each corner, and one guy is dropping his price 1 or 2 or 3 cents below the other guy, the next day you wake up and the other guy has dropped his price. It is kind of nice to see those days again.

Is that going to send the wrong signal to the American consumer to such an extent that we are going to undo our efforts toward conservation? Or do you think they have become ingrained enough that we are not going to have undue damage?

Mr. **Kalt**. I think were these prices to persist for 4 or 5 or 6 years then you will have found yourself having undone the conservation efforts. But two factors operate against that.

First, what we call conservation in large part is embodied in our capital equipment, in our homes, the insulation built into the walls, and so forth. The energy in capital stock of the Nation turns over relatively slowly. That means that it is going to take a long time before you go back to an era of the 1960's.

Second, a crucial parameter here is the expectations both business and final consumers have about what oil prices are going to do. If the past has taught one lessen it has been that oil prices are volatile, and that means that oil prices are a risky proposition from the point of view of energy consumers. To the extent consumers perceive that risk and feel that risk, they are not about to go out and invest in less energy efficient capital equipment.

My guess is that we will not see major changes in the capital stock. You will see changes in the level at which the capital stock is operated in and energy consumption will be higher, but we will have maintained the ability to conserve should energy prices rise again.

One last comment. We economists have done a lot of studies of energy conservation, elasticity of demand, and so forth. When we look back at the era of the 1970's we find it very difficult to pick up any effect on conservation other than price in the aggregate. That is, all the programs that we adopt, while here and there they may be efficient and may spur conservation in some city or whatever, in the aggregate what seems to have driven the improved energy conservation on the part of the United States has been in price, and all the various programs that we tried to institute at State, local, and Federal levels don't show up in the aggregate data as having any significant impact. They may have had some impact, but they are not very large.

Mr. VERLEGER. I think the third part of this program is that even if the consumer were to decide to go out and increase consumption, buy a larger automobile, he would find that the design of the capital stock has changed so that you cannot buy the very large six-seater passenger car like the Ford LTD and get 13 miles to the gallon. The same car today is made with new technology, and that is not a technology that is going to be lost. The airlines are rapidly replacing their old jets, sometimes due to regulation of the noise standards, and the new jets are much more efficient Boeing——

Representative LUNGREN. McDonnell Douglas, a small producer in California, first met the standards before Boeing. But go ahead.

Mr. VERLEGER. Well, they have the only thing that gets me home after midnight. They are experimenting now with these new jet engines with the props on the back end that will cut consumption by 50 percent. They are just beginning to fly the test planes in the Mojave Desert this summer. But we have redesigned the capital stock and will continue to redesign the capital stock, and you are not going to lose that effect.

Mr. FRIEDMAN. The average Btu's per household for residential heating, air-conditioning, electric use for homes built before 1939 is something like 120 or 130 million Btu's per year, and for homes built in the 1940's, the 1950's, the 1960's, and then especially in the 1970's, it has gone down. Although over the last half dozen years average square footage may have been lower, still I think it is something like 74 million Btu's per year with the latest data, which I think is 1979 through 1982. So it covered the period of the second oil shock.

I think the important point of that is that even before oil prices began to rise over the 1970's there was a trend toward more energy efficiency. I think that corroborates what has been said so far, that it is not exclusively a function of the up movements in oil prices over the 1970's and therefore it is not likely to go away as oil prices decline.

Mr. PRAKKEN. I think it is appropriate to view the reduction in oil prices as a windfall gain to those people who insulated their homes and bought smaller cars on the expectation of higher energy prices. The point has been well made that you don't rip out your insulation. On the other hand, houses wear out and you build new ones at the margin which could be insulated more or less than the ones that are wearing out.

The estimates that we use suggest that a 50-percent decline in the price of imported oil, barring any political interventions or market regulations, would lead to about 30-percent increase in oil imports over a period of 12 years. That is a noticeable response, but a very slow one. Of course, if what you had in the interim was oil prices bouncing high, bouncing low, without much change in the average price level over that period, you might not get all that much oil imported.

Representative **Lungren**. Let me ask a very specific question. I had this posed to me a couple of weeks ago by a constituent, who said, "You know, you guys ought to put that tax credit back in there for solar panels. Some guy down the street got it and, gee, it's a great thing." In fact, when they told me what they pay per month versus what I pay per month it sounded like they had made a great judgment, and they say, "You guys are making a mistake by not doing that." I had some response to them at that time.

I would just ask the four of you, given this type of example, would this be the proper time to try and force that? Or would we be going so much against the grain, since oil prices are dropping and other substitutes are also going to have to drop or they will not be competitive, that it really doesn't make a whole lot of sense for us to do that?

Mr. **Verleger**. Sir, I think the whole question of tax credits on energy conservation has been very controversial for 8 years now. When I was in the Government from 1975 through 1979, at CEA and then Treasury, we kept digging our heels in against all these sorts of things.

I think the House of Representatives spent a full year struggling with tax reform and the question of tax preferences for solar, which works nicely in southern California, where I also used to live, but doesn't work so well in Minneapolis, and it becomes a regional preference. One of the things that I think we have learned through bitter experience is that trying to achieve economic policy goals through the Tax Code just leads to one nightmare after another, particularly in this time when we are moving to a freer market. In really true market economics the last thing you would want to do is do that. If solar is so efficient for this person right now, he should do it without the tax credit.

Mr. **Kalt**. I would say right now is precisely the wrong time to attempt to subsidize particularly exotic alternatives to additional fossil fuels. The subsidies didn't make much sense based on their costs when oil was at $35 a barrel and solar equivalents were at $80 a barrel, or whatever. They make even less sense now. I would much rather have MIT training scientists to improve our agricultural sector, medicine, manufacturing, and so forth, than having them train solar experts.

Representative **Lungren**. That is another point you made in your testimony, which is that it is not a net loss to society if in fact people turn away from being engaged immediately in energy conservation if they are going to a more efficient use in society.

Mr. **Kalt**. Conservation isn't free and the development of alternatives to imported oil is not free, and in a period in which oil is relatively abundant it is appropriate to take advantage of that by consuming it.

We certainly want to be aware of the possibility that we could get nailed by higher prices down the road. Our discussion of the strategic petroleum reserve, and so forth. But conservation uses our resources, it uses our scientists, it uses labor, it uses material, it uses capital. In an economy that is at relatively full potential it is an unwise thing to be channeling resources into exotic alternatives to oil or into other conservation measures that don't make sense with low oil prices.

Representative LUNGREN. Mr. Friedman.

Mr. FRIEDMAN. It does not make sense to me either.

Mr. PRAKKEN. It seems to me the only argument that can be made for subsidizing exotic alternative energy sources is that we attach a very signficant probability to some political disruption of an otherwise free market. Absent that kind of assessment I don't see any sense in doing it.

Mr. KALT. If we attach a very high probability that the price 2 years from now will be at $50 a barrel, almost all of the evidence I have says that even at a price like that we should be propping up conventional sources of energy—coal and oil—because they are less costly than synthetic fuels, than solar power, than most of the other exotic alternatives. So while there may be an argument for propping up domestic production because you are trying to avoid the impact of higher prices down the road, those still don't argue for exotic alternatives to fossil fuels. This country has an awful lot of coal, for example.

Mr. VERLEGER. Five years ago one could make a statement that there is a high probability of higher price oil. Today we have a small but reasonably liquid futures market which gives you an indication of where the market thinks prices are going, and that gives you a way of deriving the likelihood of the market's expectation of a substantial increase in price, and the market is telling you it is not there.

Professor Kalt's comments in terms of allocation of resources are precisely correct, and that is exactly why the House, as I understand it, tried so hard to streamline the Tax Code and reduce as many of these special tax credits as it was politically possible to reduce. It is bad policy.

Represenative LUNGREN. Let me ask the panel one last question. Perhaps I shouldn't even do it since it is not one that I suggested we were going to have, but it concerns something I have been involved with in California for some time. It is a rather thorny, controversial issue, and that is the whole question of offshore drilling in California.

I don't want to get you into the question of which tracts ought to be left alone and which tracts should be allowed. Some have suggested that because falling oil prices have caused a glut of oil on the market, we ought not to be involved in this. They use it as a general argument for any offshore drilling, saying that we should not proceed until the market suggests that we are not going to have the glut of oil.

If any of you would like to take a crack at it I would appreciate hearing your response. I won't be offended no matter which way you answer it. I would just like to know.

How would you respond to that question, which is that the reserves we have out there are things that we ought to look at some time in the future, but right now we have this glut, so does it make sense for us to even go after it for exploratory purposes?

Mr. **KALT**. It seems to me that the way the economist has always attempted to answer these questions is we would like to always have a mix of supply sources that minimizes our cost of getting any given level of supply. While we may want less domestic supply of oil right now because imports have become cheaper, were it the case that the full costs of offshore development, that is, both the drilling platforms and the drilling activity as well as the environmental costs, were less than the price of imported oil, you would still want to go ahead and develop offshore oil. The probability that that is the case now has fallen. That is, the world oil price has come down, and so the probability that the full cost of offshore development, drilling costs, oil company costs, plus the environmental costs, the probability that the imported oil price is above the full cost has fallen, and it may be the case that now offshore development is too expensive for the Nation to engage in.

I think the way to think about it is not in terms of what the Nation needs: Do we really need the offshore oil? But rather does it make sense on its own terms: Is the full cost of that resource development less or greater than the benefits?

Representative **LUNGREN**. I guess the other question I would ask is, since what we are talking about is a process which basically would allow exploration and production over the next 5 to 15 years, what kind of forecasts do we rely on in making that judgment?

In other words, if you are going to bring that up today, I can look at it and say that with the fall of prices it probably would cost us too much. But I am talking 5 to 15 years from now. All four of you have warned me that forecasting is a very difficult business. We have been surprised before. You talk about the Saudis being a net importer of oil. It seems to me some years ago the Soviet Union was a net exporter of wheat. It seems to me they turned that around in a quick fashion. I guess I wouldn't want to impose that on the Saudis. They have enough problems right now without changing their form of government to prove our theoretical model.

Mr. **VERLEGER**. If I may, I am personally very painfully aware of the costs and problems connected with the development of offshore California oil. My first comment is it is never the right time.

Representative **LUNGREN**. You talk to my constituents.

Mr. **VERLEGER**. It is more than your constituents. If you look at Exxon's Hondo field up off Santa Barbara, the litigation over putting the platform in took 12 years. It was really from 1966 to 1979 before the production was brought on stream. That crude oil also turns out to be absolutely pure gunk. It is the world's worst crude oil. It is much worse than the Mexican's crude oil. It has to be taken to the Gulf Coast and it has to be taken in heated tankers.

Representative **LUNGREN**. It makes our Wilmington field oil look good.

Mr. VERLEGER. It looks real sweet. One oil field engineer I talked to said that if they had really known what they had, they would have put a mine shaft down rather than an oil well.

Oil is not oil is not oil is the first thing to be said, and you need to explore to find out what is out there, what the gravities are. In the case of the Hondo crude, refineries have to be modified and logistical systems have to be designed. Proposals to pipeline that stuff across the country turn out to be impractical because the oil is so viscous it slows down a pipeline by a factor of four.

Second, Professor Kalt is absolutely right when he says that we need to diversify our sources of supply. Indeed, we are where we are today because the world supply sources have diversified.

Economists sometimes talk about Hirfendehl indexes. The Justice Department uses a Hirfendehl index to determine whether a merger is appropriate or not, and it sets a threshold level of about 1,200 when it starts to ask questions and 1,800 as to where it will not permit a merger generally. The Hirfendehl for world oil production was around 1,900 in 1981, indicating a highly concentrated industry. It is today around 800, and the reason has been this growth in production from other parts of the world, and the development of offshore west coast crude oils is precisely the sort of diversification in supply that one wants to see.

The third point is that the development of offshore oil is expensive, time consuming, and requires an awful lot of capital. It requires budget planning; it requires foresight; and it is something that is much better done in a period of thoughtfulness when there is no panic, when the plans can be thought out under circumstances other than those that occur in crises.

So I think right now is precisely the time for the Federal Government to plan ahead the approach to it and perhaps even study the patterns that have been done in the North Sea by the Norwegians and the British, an ecological area that is like California, very delicate, very cold, where oil spills would have tragic results, heavy fishing areas, and where both the United Kingdom Government and the Norwegians have worked in a very efficient fashion with the private companies.

So the answer to your question is, unambiguously, we ought to do it and we ought to look at it in a systematic fashion now rather than in kind of the adversarial approach that has been used over the last 20 years.

Representative LUNGREN. I want to thank you for your testimony. It has been very, very helpful for me and I know the full committee will enjoy it. It is a hot issue and I am not sure we have dwelled on it a great deal in the Congress. It is something that obviously is going to impact public policy. I think you have helped me and I think you have helped the Congress by shedding a little bit of light on this subject.

Thank you very much.

The subcommittee is adjourned.

[Whereupon, at 12:10 p.m., the subcommittee adjourned, subject to the call of the Chair.]

APPENDIX

STATEMENT OF TEXACO INC.

SUBMITTED TO THE

SUBCOMMITTEE ON TRADE,
PRODUCTIVITY AND ECONOMIC GROWTH

OF THE JOINT ECONOMIC COMMITTEE

REGARDING

"THE ECONOMIC IMPACT OF
THE OIL PRICE COLLAPSE"

MARCH 12, 1986

THE IMPACT OF PLUNGING OIL PRICES ON U.S PRODUCTION AND NATIONAL SECURITY

INTRODUCTION

The precipitous decline in U.S. crude oil prices seriously threatens future domestic petroleum production and raises the specter of sharply increasing U.S. dependence on imported oil.

It has been projected that if oil prices average in the $14-15 a barrel range (approximately the current level) through 1990, net oil imports will rise alarmingly to almost half of demand, from about 27% in 1985. This results from both substantial production declines and increases in petroleum demand at the lower prices. Implications of such dependence on oil imports for our national and economic security are grave. The United States depended on net oil imports for only 35% of its needs prior to the 1973 Arab oil embargo, which led to severe shortages and a quadrupling in crude oil prices at the time. U.S. dependence on net imports was about 43% before the Iranian revolution in late 1978, which curtailed supplies from Iran, again leading to major shortages and another dramatic escalation in petroleum prices. The implications of rising oil imports for the national security are further underscored by the fact that 65% of free world oil reserves are in the Middle East where the two supply disruptions in the 1970's occurred.

A fundamental lesson from the 1970's, when two oil price shocks jolted the U.S. economy, triggering double digit inflation and substantially crimping economic growth, is that the United States can ill afford to be heavily dependent on sources of petroleum supply from areas susceptible to external disruption. Unless measures are taken now to insure the viability of domestic supplies in the years to come, the experience of the seventies could be repeated.

IMMEDIATE EFFECTS OF THE PRICE SLIDE

After peaking in 1981, crude oil prices declined substantially over the next four years and then collapsed in early 1986. This can be seen in Figure 1, which plots the posted price of West Texas Intermediate Sweet (WTI), a representative U.S. crude oil. (Posted price is the announced price which a refiner is willing to pay for a particular type of crude oil. While changes in posted prices vary among refiners, and may lag changes in spot prices in the short run, over time, posted prices and spot prices tend to converge.) In the early 1980's, WTI sold for almost $40 a barrel, but the price declined to about $27 by 1985. Then, reflecting the global turmoil in oil markets, West Texas Intermediate plunged to below $13 a barrel in the spot market.

EFFECT ON CURRENT PRODUCTION: STRIPPER, MARGINAL, AND HIGH COST WELLS

Production rates begin to fall off when price drops become significant. In the United States, a total of 1.3 million barrels of oil per day is produced from roughly 450,000 stripper wells (wells which produce 10 barrels a day or less), approximately 12-14% of total U.S. production. About 400,000 of this 1.3 million total comes from wells producing 3 barrels/day or less. Production from these low yield wells is particularly sensitive to price, as operating costs for most such wells in the nation's mid-continent area slightly exceeds $15/barrel.

If a $15/barrel price level or below continues, a significant percentage of stripper wells will be plugged and abandoned. Once plugged, many of these wells will be lost forever. A study released by the Interstate Oil Compact Commission projects that 22.5% of all U.S. stripper wells would be abandoned in 1986 if prices are at the $15/barrel level. In Texas and Oklahoma alone, roughly 150,000 barrels/day from stripper wells would be lost.

Texaco has had to evaluate its own producing operation in line with the collapse in oil prices. For example, Texaco USA has been producing roughly 100,000 barrels per day from a steamflood enhanced oil recovery project in California's Kern River Field. In early March, Texaco closed down about 1,500 wells in this field because of collapsing prices. These wells produced over 10,000 barrels per day of oil. Other companies have announced shut-in of over 3,000 wells. If current price levels continue, we would anticipate many more wells will be shut-in as uneconomic.

INDUSTRY CUTBACKS IN E&P SPENDING WILL REDUCE FUTURE LEVELS OF PRODUCTION

In addition to the immediate reduction in crude oil production from shut-in wells, lower oil prices also portend even steeper future production declines as exploration for new reserves is cut-back. Unless current production is replaced through exploration programs, the depletion of existing reservoirs results in declining volumes of future production.

Cash flow is the combination of earnings and non-cash charges, such as depreciation and depletion, which represent recovery of prior investment. Cash flow determines spending in the oil industry. Cash flow is the prerequisite for the E&P expenditures needed to continually replace reserves. In turn cash flow is highly sensitive to oil prices.

Lower oil prices also adversely affect the economics of new exploration projects by reducing the anticipated rate of return. In recent weeks, reflecting lower cash flow and deteriorating economics, individual firms have announced substantial cuts in their capital and exploration budgets (CAPEX) in direct response to falling crude prices. Exxon and Chevron recently announced that they would reduce their CAPEX budgets by $2 billion and $1.5 billion respectively. Cuts of 10-30% or more have been announced by Texaco, Arco, Phillips, Amoco, Conoco, and Unocal. The Oil & Gas Journal mirrored these reports with its own February 24, 1986 estimate that industry's expenditures in the U.S. upstream will decline over 25% in 1986.

PROJECTING FUTURE DOMESTIC EXPLORATION SPENDING

Figure 2 demonstrates a strong relationship over time between drilling and real crude oil prices. (Real crude prices are actual crude prices divided by the GNP implicit price deflator to adjust for inflation.) For example, in response to a steady decline in real crude prices, wells drilled declined sharply between 1956 and 1971.

Current events mirror this past performance. Hughes Tool Co.'s data (Figure 3) shows the rotary rig count has plummeted in recent weeks to 1,248 and is still dropping. This is a dramatic falloff from the peak of 4,530 rotary rigs used in 1981. The historical relationship between drilling and price provides little optimism for a rebound in drilling as long as prices remain low. Falling prices and declining exploration set the stage for the shortages and price spikes of the 1970's.

The economics of oil production determines spending for new exploration and production projects in the U.S.A. Simply stated, an operator's anticipated rate of return on new projects and actual cash flow from existing operations dictate that operator's ability to make new investments. Given the present depressed price levels for oil and gas, it should come as no surprise to anyone that the nation's energy producers are having to slash investment budgets. (Figure 4)

Even at high previous spending levels in 1981 and 1982, it should be realized that if one disregards Prudhoe Bay production, the "Lower 48" production has been flat to moderately declining since 1976. If these investments had not been made, "Lower 48" production would have fallen dramatically. Immense E&P spending barely stabilized this production.

PROJECTING FUTURE DOMESTIC PRODUCTION LEVELS

The Data Resources Inc. U.S. energy model indicates that both petroleum product demand and oil production are significantly responsive to price declines, with the result that lower oil prices result in sharply increased dependence on imports. Figure 5 summarizes DRI's production projections under three price scenarios.

Simulations that DRI ran on its energy model forecast that if crude oil prices are in the $23.00 to $27.00/barrel range (high case) between 1986 and 1990, overall oil demand would fall by about 500,000 barrels a day over that period. Domestic production would fall by about 700,000 barrels a day and net oil imports would rise from about 26.5% of demand in 1985 to 31.0% in 1990.

According to the DRI simulations, if prices run in the $18.00/barrel to $20.00 range (base case) through 1990, domestic production would fall by over 1.1 million barrels a day and demand would rise by 1.2 million barrels a day. Net oil imports would rise to 6.79 million barrels a day (from 4.15 million in 1985) and net oil import dependence would rise to 40.2% (from 26.5% in 1985). In its low price simulation, DRI assumed crude oil prices to average about $14-15/barrel (low case) through 1990. Under this scenario, domestic production would fall 1.7 million barrels a day through 1990, and U.S. demand would increase 3 million barrels a day by 1990. According to this scenario, the United States would be dependent upon foreign sources for almost half of our net supplies by 1990.

In the DRI low case scenario, it should be noted that the slope of the projected production decline reaches a rate similar to that experienced in the early-to-mid 1970's. Assuming a constant reserve-to-production ratio in 1990, it can be projected that the decline in domestic reserves would fall from approximately 28 billion barrels of oil to about 23 billion barrels in 1990 in the DRI low case scenario. They would decline to approximately 25 billion barrels in the DRI high case scenario.

IMPACT ON NATURAL GAS

Natural gas is also affected by an oil price decline. The Wall Street Journal on March 13, 1986, noted that plunging fuel oil prices were causing many industrial firms, utilities and commercial concerns to switch from natural gas to fuel oil. If firms do not switch, they will use the threat of switchover to force price concessions from gas suppliers. This will exacerbate the cash flow problems of producers who sell both oil and gas. The ultimate result will be lower additions to natural gas reserves as well as oil reserves and reduced levels of future production. In 1984 new discoveries of natural gas were 13.5 trillion cubic feet (TCF) compared to production of 17.2 TCF, while natural gas reserves dropped to their lowest point since 1951 at 197.5 TCF.

Likewise, the low natural gas prices that are the result of low crude prices do not provide any incentives for the exploration and drilling for gas. The failure to find and develop new reserves will accelerate the depletion of the current gas deliverability surplus and set the stage for gas shortages in the future.

ENERGY/NATIONAL SECURITY POLICY IMPLICATIOS

In the late 1970's (see Figure 6), the United States was dependent on imported crude oil and petroleum products for as much as 47 percent of its demand. This made the United States vulnerable to periods of supply disruption which resulted in sharply higher prices. In 1985 this dependency was reduced to a net import level of 27% through a combination of increased price incentives to the industry and conservation. The DRI low case supply and demand projection ($14 - 15 per barrel) indicates that our country's import dependency would soar again to almost 50% by 1990.

As the gap between domestic production and demand widens and is swiftly filled by rising imports, the stage is set for another oil shock. If oil imports again rise to almost 50 percent of total demand, the United States will have exceeded the level of vulnerability previously reached in the late 1970's - just before the Iranian Revolution.

There is a disturbing sense of the past repeating itself in the current euphoria over oil price declines. The attractiveness of significant stimulants to many sectors of the economy has apparently caused some policy-makers to forget the lessons of the 1970's - that approximately 65% of the Free World's oil reserves are located in the Middle East and that excessive dependency on that area of the world has led directly to economic shocks and serious foreign policy problems. Senator Lloyd Bentsen (D-TX) has noted that "if we learned anything from the Arab oil embargo of 1973, it's that we cannot afford to get hooked again."

Similarly, many alternate energy projects will be terminated, although it is obvious that such projects are needed to replace declining domestic production and declining domestic reserves. The painful U.S. experience of the 1970's has surely taught Americans that dependence has very real consequences. Many of today's glowing economic statistics will be turned upside down with another oil disruption, if we permit the domestic producing industry to be shattered.

The Economic Modeling Forum (EMF) is a Stanford University institute set up to compare the results derived from various economic models of government energy policies or market changes. In a study based on the EMF, Professor James Sweeney of Stanford looked at a scenario in which U.S. production fell off 1.1 MMB/D by 1990. A supply disruption in that time frame would raise crude oil prices by $33 per barrel, increase unemployment by 2 percentage points, increase the federal budget deficit by $25 billion and decrease real GNP by 4.9 percent. For purposes of comparison, a real GNP decline of "only" 1.7 percent between 1981 and 1982 constituted the worst recession since the

Great Depression. If analysts are right in predicting that we could see declines in U.S. production nearing 2 MMB/D, about twice the decline utilized in the Sweeney study, major new national policies must be implemented promptly.

CONCLUSION:

The U.S. Government should undertake a comprehensive energy policy review on a priority basis. A determination should be made as to the minimum level of domestic crude production required to protect our energy and national security. Key areas of the economy will be adversely affected if increasing levels of petroleum imports lead to the reestablishment of OPEC's control over the market and another supply disruption. These areas include GNP growth, employment, inflation, interest rates, trade deficits and the federal budget.

Ultimately there is the issue of national security. The U.S. has already lost some stripper production on a permanent basis. More production will be lost each passing week if prices continue at current levels or slide further. Domestic exploration programs have been severely cut and important parts of the oilfield equipment infrastructure have been lost. In 1985 U.S. domestic crude oil production averaged 8.9 million BPD. If U.S. policy is to sustain this level of production, forceful government policies must be adopted immediately. We should not let production simply drift to lower levels without a conscious policy decision as to what the national interest dictates. If lower levels of production are acceptable, the minimum level nonetheless must be promptly identified and appropriate policies put in place to ensure, considering operational lead times, that these levels are not breached.

A listing of some of the more critical issues and questions relevant to the determination of the minimum level of U.S. production required by our energy and national security is set forth below. Responsibility for the resolution of these economic, trade, energy policy and national security issues lies in many different departments, agencies, and committees in both the Executive and Legislative branches of the U.S. Government. Leadership and coordination will be required to ensure that such divided responsibility does not result in the failure of any party to accept responsibility for these difficult and complex matters which vitally affect the national interest. In the past, there has been a tendency to deal with politically difficult problems of this nature only in a crisis. Unfortunately, our country's inability to address and resolve such problems in advance of a crisis cost the U.S. economy in the 1970's billions of dollars in addition to a loss of policy flexibility and significant additional costs in the areas of both foreign policy and defense.

In the absence of any indication of a policy shift by the U.S. Government, it is reasonable to anticipate that, if present trends continue, U.S. companies will continue the disturbing pattern of production shut-ins and exploration cutbacks required by plunging cash flows. Texaco believes that current trends and developments in the energy sector contain the potential for a future shortage which could compromise our economic and national security to a greater extent than in the 1970's.

Issues to be Addressed:

1. To what level must domestic crude production fall before the economic, national security and foreign policy concerns outweigh the short-term economic benefits of low oil prices?

2. How much current domestic crude oil production becomes uneconomic at prices of $15, $10, or $7 per barrel, and how much production is likely to be shut in at these prices?

3. In each case, how much of that shut-in production could be restored if prices rise to 1985 levels, and how much of a time lag is expected? How much of that shut-in production is expected to be irrevocably lost?

4. If prices remain low for a prolonged period of time resulting in a production decline, how much lead time and what expenditures will be required to mount a crash exploration program to prevent excessive reliance on imports?.

5. At what level of import dependency does OPEC regain control over the market?

6. What will be the effect on today's record trade deficits if petroleum imports rise at projected rates?

7. Will increased future imports be in the form of crude oil or products? If products imports greatly increase, what will be the impact on the domestic refinery industry?

8. What areas of the world will supply the incremental crude imports? How politically stable are these areas?

9. What additional national security costs will be borne by taxpayers to protect against supply disruptions? For the Strategic Petroleum Reserve? For the Rapid Deployment Force? For the U.S. Navy to assure that sea lanes are secured?

FIGURE 1

CRUDE OIL PRICES

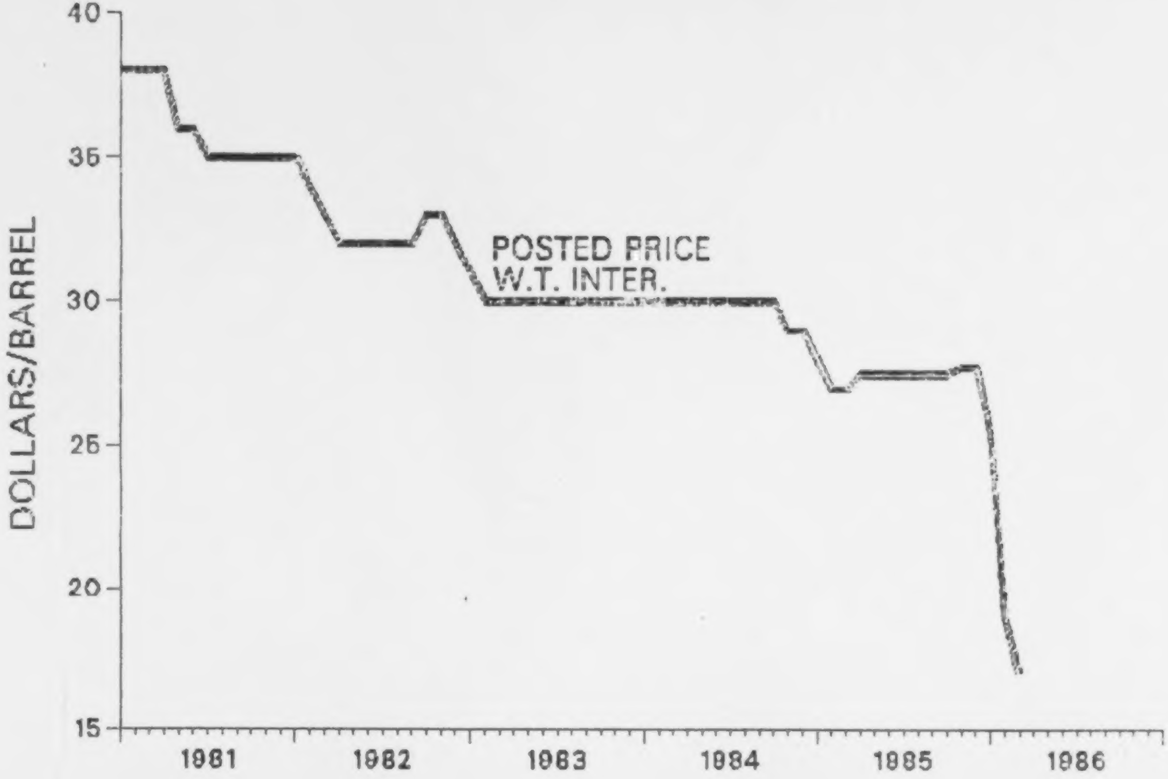


FIGURE 2

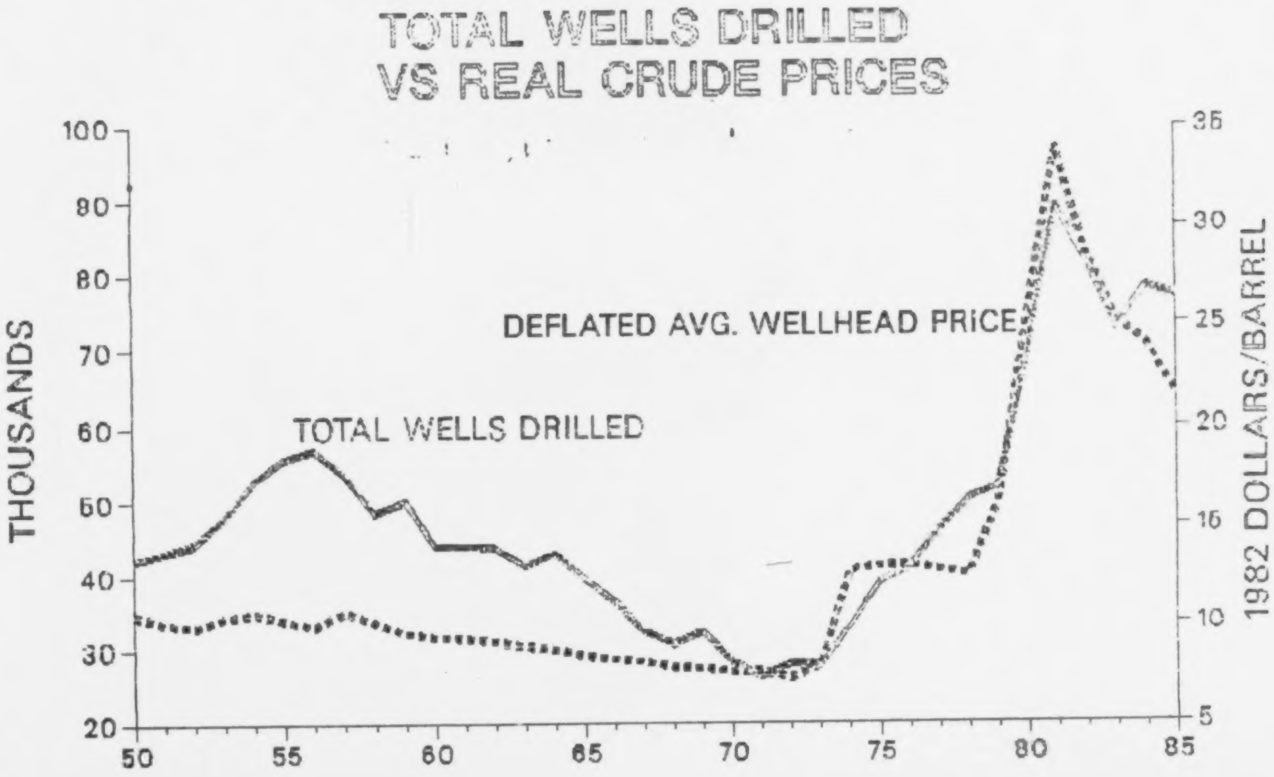

TOTAL WELLS DRILLED
VS REAL CRUDE PRICES
THOUSANDS
100
80
80
70
60
50
40
30
20
50
55
60
65
70
75
80
85
35
30
25
20
15
10
5
1982 DOLLARS/BARREL
DEFLATED AVG. WELLHEAD PRICE
TOTAL WELLS DRILLED

FIGURE 3

HUGHES RIG COUNT

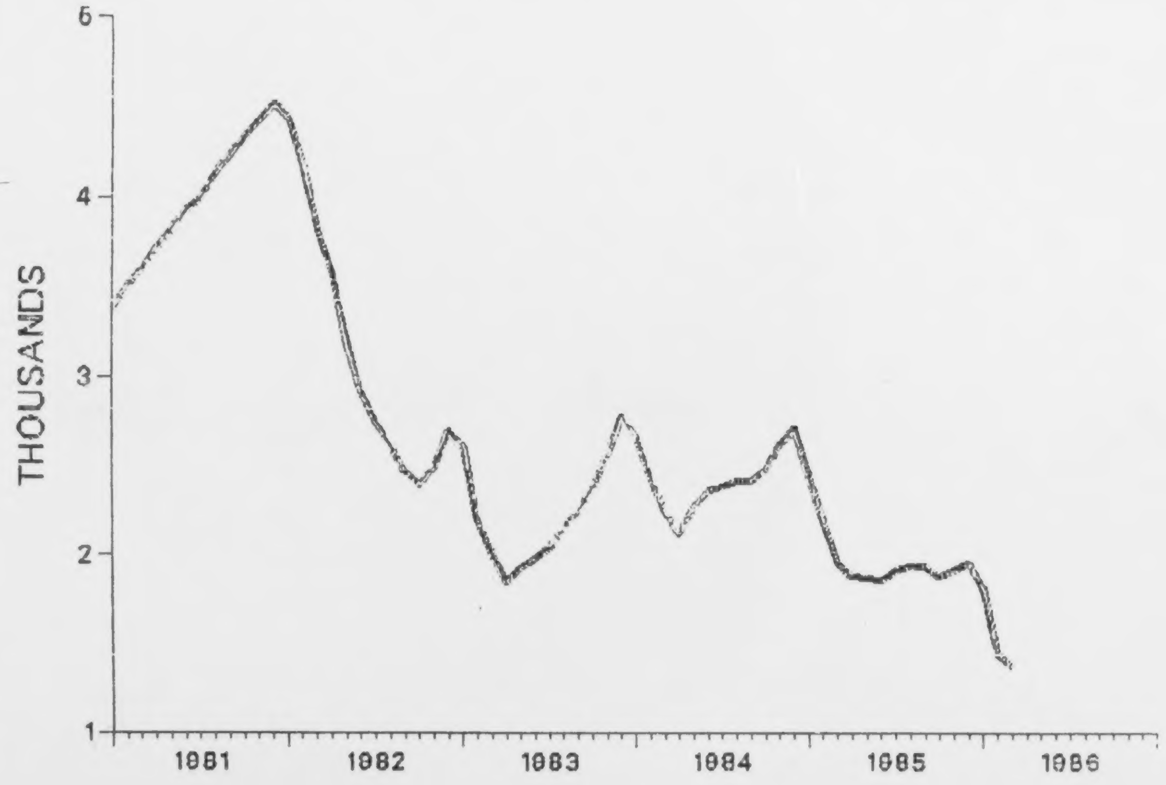


FIGURE 4

EXPL. & DEV. EXPENDITURES
VS PRICE OF CRUDE OIL

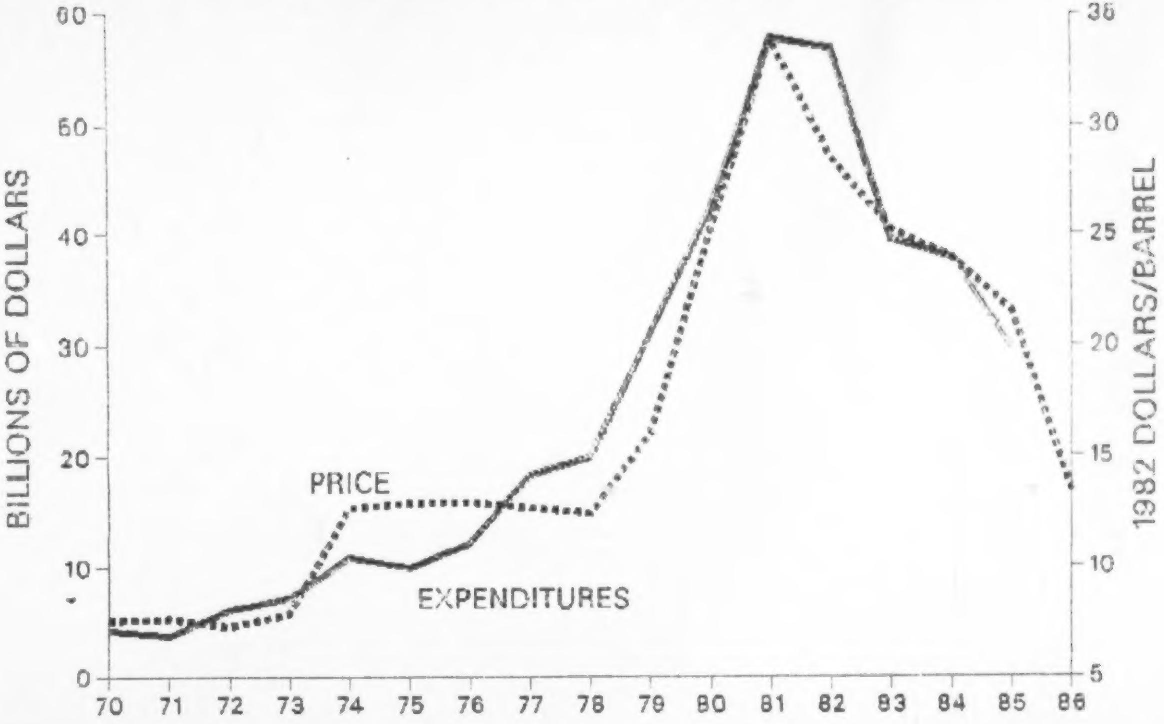
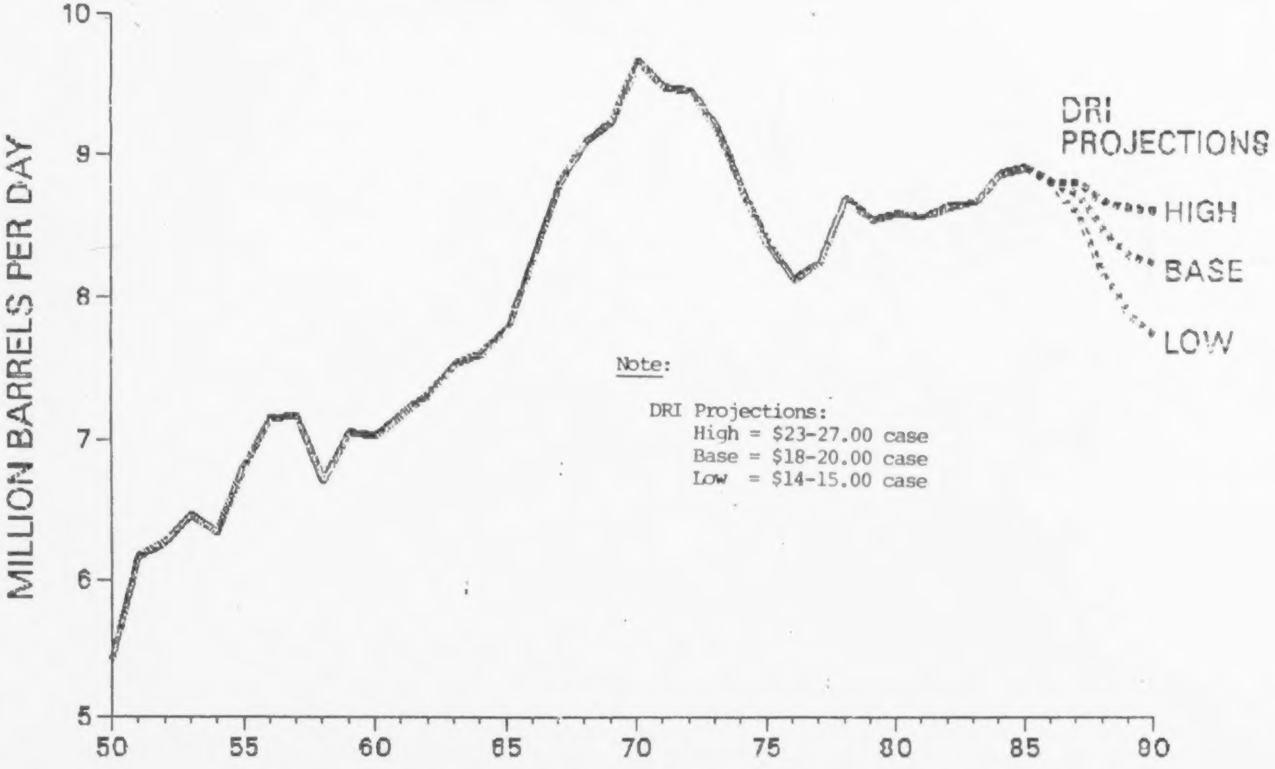


FIGURE 5

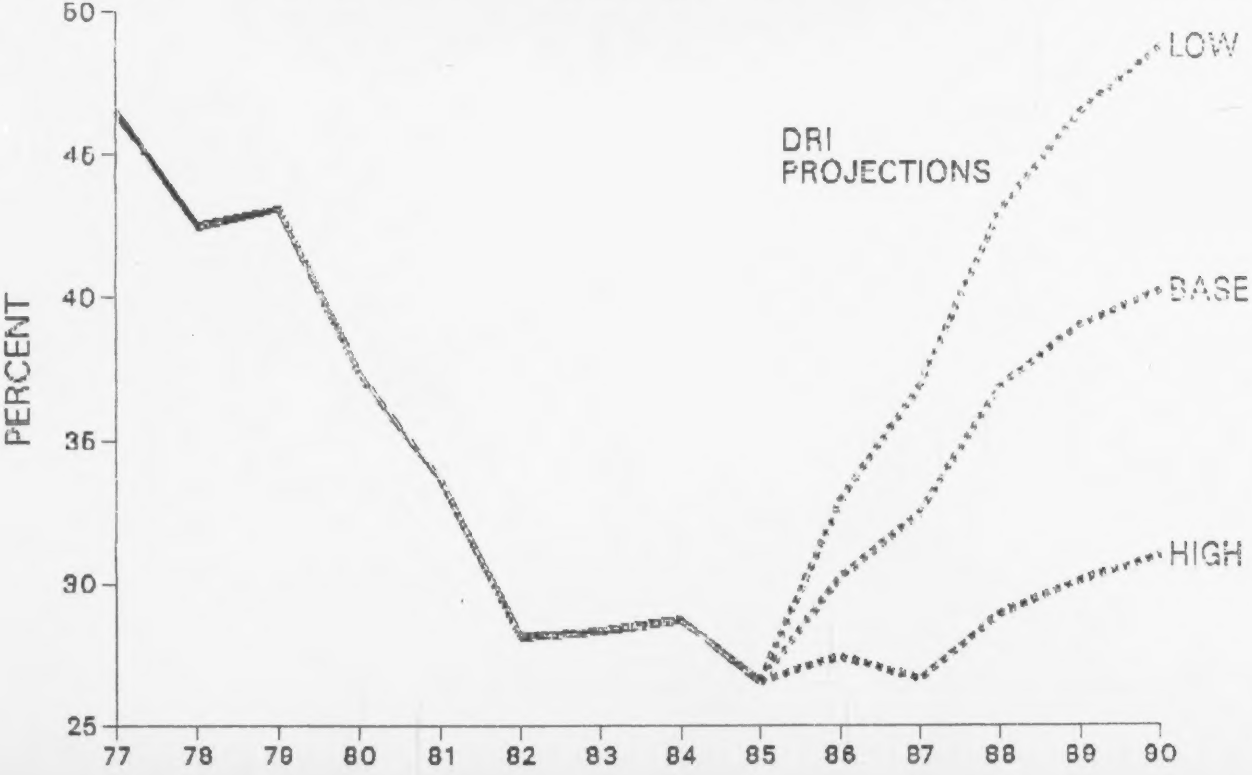
U.S.CRUDE OIL PRODUCTION



Note:

DRI Projections:
High = $23-27.00 case
Base = $18-20.00 case
Low = $14-15.00 case

FIGURE 6

NET IMPORTS AS A % OF U.S. PETROLEUM DEMAND